approach

DECEMBER 1978 THE NAVAL AVIATION SAFETY REVIEW

COLD WEATHER SURVIVAL

THE months ahead demand that all pilots and flight crews prepare and plan for winter survival. There will be a few lucky souls who will spend the winter in balmy climes where the temperature on a cold day is in the 60s, but the great majority will be operating where snow, ice, and blizzards are commonplace. This means not only knowing what survival gear is required, but also knowing how to use it and checking to see that it's operationally ready.

Safety officers, why not consider a little drill? Split up the pilots/flight crews into two teams. Have half of the members of each team spread out their survival gear on the hangar deck and the other half identify the items and demonstrate survival uses for each. You can use riggers to check for the completeness of each bag. Any missing or malfunctioning items would constitute an unsat bag.

Over land. Let's consider first that your bird becomes so sick you have to jump out over land. You are now leaving a nice, warm cockpit for 6 to 12 feet of snow. If you have played the "what if" game, stayed awake during survival lectures, and have a plan in mind, you're way ahead of the game.

You know what survival gear is strapped to your back, how to use it, and you remember not to throw anything away until you're absolutely sure that it can't be used. Let's assume your ejection was routine and you've landed in good shape. You're hip deep in snow and after working your way out you gather up the chute.

This is where prior planning is going to stand you in good stead. For example, you know that there's a certain priority you want to follow. Get all your gear together, get out of the weather, and relax. You know searchers will be looking for you, so you'll want to get your signaling equipment ready. One important decision has to be made: to stay where you are, or try to walk out. A rule of thumb (unless you know exactly where you are) is stay put!

While still strong, clearheaded, and not hungry (you did have a good meal before flying didn't you?), get established. Use what's available on the ground and supplement what nature provides with survival items you're carrying. Nothing but snow? So what else do Eskimos have? Snow is excellent building material. Once you've built a shelter it's essential to have a fist-size ventilation hole. Improvise so you won't have to sleep on the snow. Use branches, your raft, anything to get your body above the snow.

If there are plenty of combustibles available, get a fire started and keep it going. If you have to hunt and scrape for something to burn, lay the material but don't light it until it can attract searchers to your position. Be sure to have the fire in the open, or a clearing, and try to find a place where you can clear out the snow below it. If not, then ensure the fire has a good platform support, at the snow level.

Move deliberately but not fast. The best way to stay comfortable is to stay dry, and if you're sweating that's not good. Wear your clothing loosely. Several light layers are better than one heavy one since trapped air between layers is good insulation. Try to keep snow off your clothes, since wind chill will refrigerate you. While working, try removing a layer of clothing or loosen the wrists and neck

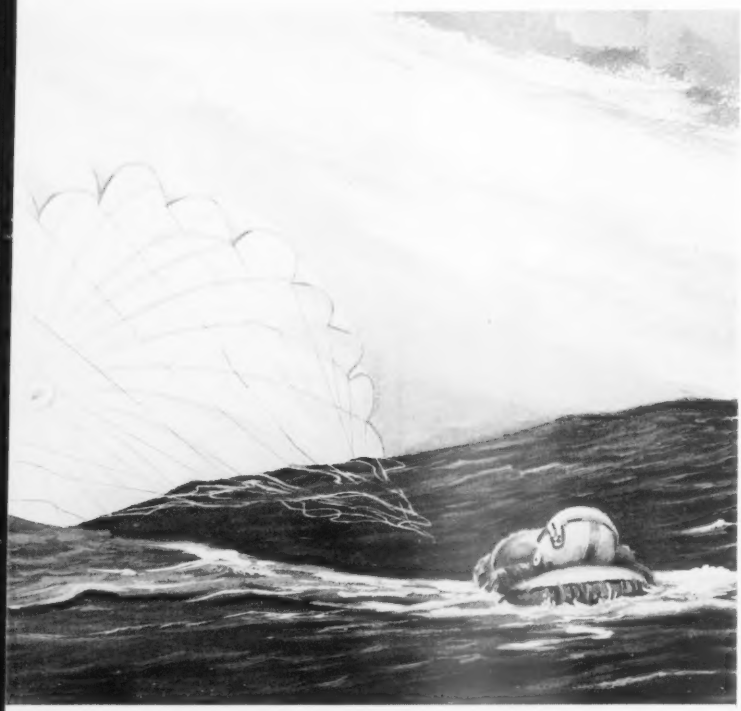
areas to allow excess body heat to escape. Naturally when sitting quietly, resting, close the loopholes and put on another layer. Drink plenty of water, to preclude becoming dehydrated. Don't eat snow, melt it and drink it.

Abnormally low body temperatures can be prevented by moving around, light exercise, and eating something to fuel the body. Above all, don't let body extremities become numb or get the shivers without doing whatever you can (move around) to keep control.

The mind will only remain alert in proportion to your body. Plan on a long stay and attend to your personal comfort. If everything is beautiful your brain can be worked overtime to figure out even better things.

In the water. OK, everyone out of the pool. Quiz! What is the OAT below which NATOPS requires pilots/flight crews to wear an antiexposure suit? Thirty-two degrees (wind chill factor corrected). That's partly right. The suit is also required if the water temperature is 50 degrees or below.

Consider two thumbnail sketches of pilots involved in winter water survival situations:



***Pilot A, water 50, in a suit**

I was within gliding distance of land at FL high. The next thing I knew my aircraft was hit, I was inverted, and had to eject. The opening chute knocked the breath out of me.

On the way down I tried to use my PRC-90 but couldn't receive. I put the radio away and prepared for a water landing. Once my feet hit I pulled down on the chute release and it drifted away, behind me.

Once in the water I used the radio to talk to a circling playmate. I felt exhausted. He left, but a C-130 flew overtop me and I told him I was below him. (No one received any of my transmissions.) The expected helicopter did not show up. Now I know what went on in the mind of the Fagawe chief when he realized he was lost.

I crawled into my raft and the radio slipped overboard. I hadn't ensured it was tethered. I wondered why it was taking so long. I knew my seat pan had an emergency beacon, I'd used my radio, and I put out the green dye marker.

I saw several aircraft searching for me and took out my strobe light. It worked for about 20 seconds and went out. I didn't worry. I always carry a second one and put it to work. Some aircraft passed within a half mile, but no one saw me. By now I'd been in the water an hour.

A helo came straight at me at 200 feet and I popped a smoke flare. I felt lower than a snake's belly when I saw him pass without any sign. A C-130 headed at me and I fired another flare, same result. Another helo had me boresighted and I fired one right at him. The pilot saw me and as he turned into the wind I popped the night end to help him with wind direction. As he lowered the collar I abandoned my raft, swam to the harness, and was picked up.

I had been in the water 2 hours and strangely no one had seen any of the strobes or smoke. The helo pilot saw me by sheer chance. I'd rather have luck like this than a license to steal.

*Down in the Cold Atlantic, DEC '77

****Pilot B, water 50, not suited**

The engine quit and the pilot ejected. During descent he jettisoned his seatpan – he didn't want the extra weight while in the water, and he was in sight of the carrier.

When he entered the water he went to instant chill. He had trouble floating, was swallowing lots of water, and had difficulty breathing. He became excited and apprehensive. The pilot pulled one toggle on his LPA, forced himself to relax, and then managed to inflate his life preserver.

The helicopter rescue swimmer was not wearing his suit either. His mask fogged up and the sun blinded him. He had to swim around the pilot until the sun was at his back.

Shroudlines were wrapped all around the pilot's neck and feet. He thought he had released his chute but he had not. The swimmer opened one of the Koch fittings but had a hard time releasing the other one.

Eventually the swimmer cleared the pilot of all shroudlines, worked him away from the chute, and signaled for the pickup.

The swimmer planned to rescue the pilot by attaching the hoist hook to the pilot's torso harness D-ring. However, neither the pilot nor the swimmer could find it. The sling was on the hoist so the pilot entered it and went up first. The crewman who did not have on a swimmer's harness had to wait and go up on the next trip.

Before flight operations that day all flight crews had been briefed that OAT was 66 and the water temperature was 50. Why the pilot elected and was permitted to fly without a suit is not known. This was a violation of NATOPS. The helo swimmer wasn't wearing his suit 'cause he had received bad dope. He had been told the water was 66. Good grief!

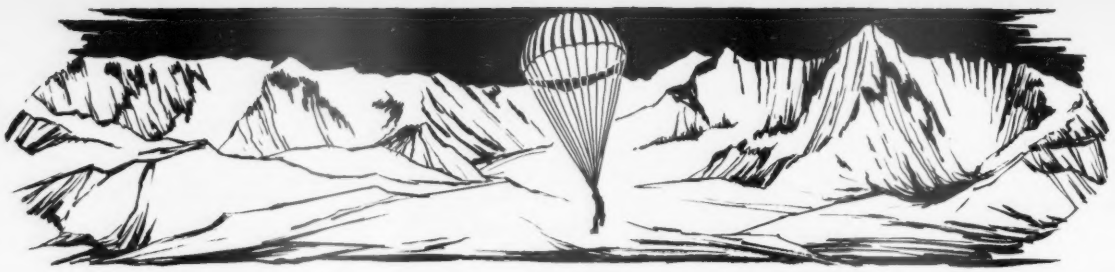
One of the cardinal rules of survival is never destroy any survival equipment. The pilot should have deployed his liferaft before water entry. This would have decreased the seat pan weight and would have been a way to escape from the uncomfortably cold water.

Anyone in a cold water/cold weather survival situation has enough to cope with without being unnecessarily handicapped by the cold.

The importance of using required flight gear and survival equipment when prescribed cannot be overemphasized. Wear it! This will give you an edge that may save your life.

**Winter Water Survival, Jan '75

Continued



In summary, to prepare for a winter survival situation, over land or water, think about the problems with which you'll be faced. Organize in your mind the 1/2/3 order of things. Develop a plan of action which you plan to follow and memorize it. It isn't a bad idea to inventory your survival vest periodically to ensure all necessary items are in the proper place. Subject those items which can be tested to tests. Look carefully at those items which cannot be tested to ensure shelf life hasn't expired, and see that abuse has not rendered any items unusable. Encourage others to play a quick hand of "what if" with you. Talk to the riggers about your survival equipment. Finally, listen to your flight surgeon when he talks about hypothermia and other good things. You can bet the sierra hotel pilot, who waited 2 hours for help to arrive, had taken this route long before he had to jump. He was ready. Are YOU? ◄

***Survival Equipment Sitrep**

ESCAPAC

Ejection Seat Replacement Program – A recent decision resulted in a new look at ejection seats, to introduce current state-of-the-art, to improve performance and reliability.

Helicopter Aircrew Survivability – This program has been put on the front burner to enhance crew and passenger survivability.

Nomex Replacement – A new suit, Aramid Knit Coveralls, is being tested. The coveralls fit better, are more comfortable, look better, and provide improved fire resistance. Approval for service use is expected in a couple of months.

Anti-exposure Suits – Several developments are underway to improve present suits. The CWU-21/P (with the CWU-23/P liner) will be the preferred suit for the next few years. The CWU-33/P is an authorized alternate.

Emergency Radio – URT-33A still isn't too reliable. Batteries need to be replaced each calendar/phase inspection. PRC-90 purchases are being increased and plans are firm to equip rescue motor whaleboats with this radio. PRC-112 is a long-range project and deliveries aren't expected for 3 more years.

Automatic Life Vest Actuator and Chute Divestment – This device is receiving maximum attention. Testing of four auto-actuators has been completed. The device involves a battery activated by immersion, which fires a squib to initiate CO_2 inflation. Fleet introduction is expected next summer,. The chute divestment automatic feature is another year away.

*Adapted from Naval Aviation News, July '78.

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"Twits, Pillocks, and Burkes"

AS a British Exchange Officer at the Naval Safety Center, my day starts off as a member of a car pool journeying 20 miles to my place of duty. (The other two guys enjoy being driven by an English chauffeur, adds class or something, they say.) During these journeys, I have introduced them to several colloquial English words to describe the antics of certain drivers we encounter. For example: "Burke" – Driver who, after summing up a situation and sensing danger in the offing, still carries blindly on with the ensuing "pucker factor" being applied to all concerned. "Twit" – Stupid driver who changes lanes without use of mirror or flashing indicator. "Pillock" – An idiot who, having gotten himself into the wrong lane, then expects everyone else to give way so that he can get to where only he knows he wants to go, with or without use of flashing indicators or consideration for traffic flow.

Up to now, I have only used these words in conjunction with drivers. However, now I have reason to consider expanding their use to aviators. To see why, let me tell you a true story.

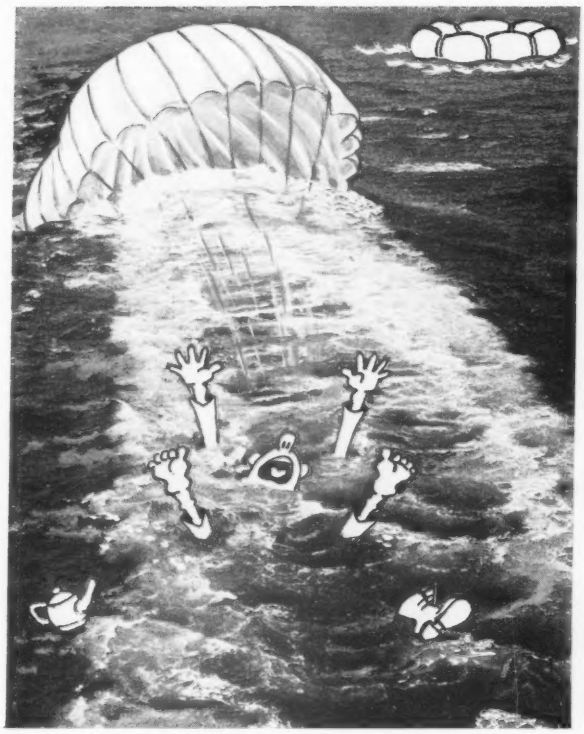
A certain pilot was assigned to fly "shotgun" for a student air-to-air gunnery mission, scheduled to be conducted, as usual, in an overwater warning area. On the way out to man aircraft, his flight leader remarked on the shotgun pilot's failure to wear a life preserver.

"I shall," he replied, "be within gliding distance of land." (Two "Burkes.")

After a "Twit" had a midair collision (all four aircrew successfully ejected), one "Burke" became a "Pillock." Descending in his parachute, he deployed the seat pan and then removed his flight boots to afford greater swimming ability. Stand by for more to come, chaps. He then released his lower Koch fittings prior to water entry, thinking his raft would be retained. "Away all boats!" Finally, after water entry, he was the only one of the four pilots who failed to get rid of his chute, and subsequently he was dragged.

Seriously, though, this pilot's disregard for regulations, not to mention common sense, plus his unfamiliarity with his survival equipment, could easily have cost him his life. Several aspects of this accident need to be discussed from a survival standpoint.

First, this myth about gliding distance from land needs to be cleared up once and for all. I don't care who designed, constructed, or maintained your aircraft, any gliding characteristics the airframe may have inherently built into it are denied you as soon as you eject. So, as stated in OPNAVINST 3710.7, you *will* wear a life preserver when flying over water. "Gliding distance from land" was deleted years ago.



Secondly, survival situations are thrust upon you – not chosen – so be prepared, know your equipment, how it functions, and its limitations. For example, two people can use a single-seat liferaft in an emergency.

If your state of survival preparedness classifies you as a "Twit," "Pillock," or "Burke," then be my guest and do something about it. If you choose not to, then remember: Wells Fargo paid the guys who rode "shotgun" on their stagecoaches a few extra bucks to make it attractive; their life expectancy wasn't too great. Need I say more?

Unscheduled and Unsuccessful Short-Field Landing. For unknown reasons, the C-117 TPC (plane commander) wanted to land his trusty old *Super-Gooney* at a what was believed to be a 2700-foot gravel airstrip. Information about the airstrip was sketchy at best. The latest info he had was 8 years old and no longer in any existing pubs. ATC denied a clearance.

Not to be preempted in his attempt for notoriety, the TPC elected to file for a published airfield with the option to proceed VMC to the non-published strip for a "look-see". Approaching the "airstrip" the TPC made a low pass to determine the runway condition and prevailing wind. After determining that all looked good, the pilot elected to make a short-field approach to landing. Full flaps, gear down, 78 KIAS and touchdown just past the threshold (wherever that was). Braking appeared to be normal and the aircraft began slowing down (partially due to the uphill gradient).

Now enters the Wizard and the troubles began. As the 117 passed over the rise it became evident that this so-called runway wasn't even 2700 feet long! Max braking by both pilots couldn't prevent the inevitable. The venerable old bird was headed for the "toolies". Even a deliberate attempt to ground loop couldn't prevent the aircraft from running off the runway. It nosed-up momentarily, dug in its props, went over an embankment and finally came to rest in several feet of soft ground.

History has recorded many unauthorized flights and landings (or attempts at) but there are those that will always try to beat the system. What are NATOPS and unit SOPs for! To paraphrase a popular song "When will they ever learn . . ."

Wrong Tire. While in the traffic pattern shooting touch-and-go landings in a P-3, the pilot experienced increasingly excessive noise and nose gear vibrations and terminated the flight after the fifth landing. He taxied back to the line and shut down.

After the aircraft was secured and while investigating the nose gear assembly, it was discovered that the left nosewheel assembly had a T-39 main landing gear tire built on the P-3 nose landing gear assembly. The T-39 main landing gear tire is size 28 by 6, whereas the P-3 nose landing gear tire is 28 by 7.7. This error escaped detection by the assembler, the AIMD CDI, the O-level installer and CDI, a daily inspection, and two turnaround inspections.

This incident should be an attention-getter for T-39 and P-3 operators. It should also serve as a caution signal to maintenance personnel regarding the necessity of checking numbers prior to the installation of a spare part.

Beautiful. LT C. H. Miller and his observer/navigator AMS1 J. Lubresky picked up a UH-1N from the contractor's plant and took off on a ferry flight. When approximately 8 miles out and while cruising at 110 KIAS and 1500 MSL, the pilot encountered a severe one-to-one beat with 6-8 inches difference in blade track.

The pilot called the tower and told the controller about his problem. He reduced airspeed to 75 knots and began a descent. The vibrations didn't lessen and the pilot told the tower he would make an emergency landing in a field 6 miles southeast of the departure point.

LT Miller landed in the field, secured the engines, and used the rotor brake to secure the blades. Inspection revealed the pitch change link of the red blade had failed in flight. Only the fractured retaining bolt and bearing housing maintained the scissor's integrity. The aircraft was repaired in the field and satisfactorily test flown by contractor personnel.

The immediate and correct analysis

of the critical nature of the emergency averted what could have been a catastrophic failure and probable accident. Had LT Miller elected to autorotate, or had he elected to hover-land the *Huey*, the continued stress on the pitch change link/scissors bearing through bolt would probably have caused it to fail. Great job, LT Miller.

Going, Going, Gone! Two naval aviators found themselves in somewhat of a bind, but handled their emergency in textbook fashion and landed without incident.

LTs John J. Flanagan and John V. Rowney launched for a local T-28 training flight. They were holding in IFR conditions at Hebron Intersection, Salisbury, MD, at 5000 feet when the circuit breaker for the No. 1 inverter popped. The circuit breaker was reset, and the inverter came back on the line momentarily, then failed without popping the circuit breaker. A switch was made to the No. 2 inverter and to BATT ONLY, restoring a.c. power for a few seconds. At this time, the rear cockpit GENERATOR OFF light illuminated, ICS and radio failed, but the engine instruments continued to function.

The pilot squawked 7700 on his IFF, established a partial panel scan, and attempted to climb to VFR conditions above the haze. After a few minutes, the landing gear indicators began to barber pole, and the decision was made to descend through the haze before losing the turn-and-bank indicator. The pilots leveled at 1500 feet, where sufficient attitude reference was available to maintain level flight. The IFF was then switched to 7600, and the battery was secured to conserve remaining power in case partial panel flight became necessary again.

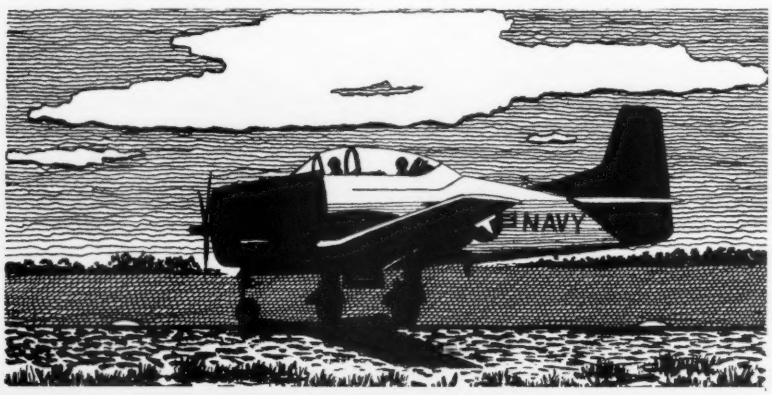
NAS Patuxent River radar observed the 7700 and 7600 squawks and vectored another T-28 to a successful rendezvous. The flight returned to Andrews AFB for landing. A positive gear check was made by the other T-28 pilot when the runway was in sight at 1½ miles on final. Weather was partial obscuration, indefinite ceiling, visibility ¾ mile in haze with the tops of the haze at 10,000 feet. Nothing beats following SOP and using good common sense.

Lamps Out Can Be Maddening. My trusty copilot and I climbed into our H-2 for a combined DLQ (Deck Landing Qualification) and TORPEX (Torpedo Exercise) hop. After rotor engagement, we turned on our radar altimeter low-level pointers to the standard DLQ setting of 40 feet. After launch, we were advised that the submarine was at periscope depth and nearly ready for the TORPEX. Seeing as how this was a perfect opportunity to get a little MAD time, I climbed to 500 feet, deployed the MAD bird and commenced practicing MAD tactics. We completed these tactics descended alongside the sub's periscope to make appropriate hand signals.

Passing 200 feet, my copilot let out with several expletives deleted and simultaneously yanked up on the collective! Sure enough, this dummy in the right seat (me) had forgotten to reel in the extended MAD bird. My copilot's timely action saved not only the MAD bird but possibly the H-2 and us.

Postflight analysis of this incident revealed that I had not turned the radar pointer (and consequently the accompanying warning tone) up to 200 feet after deciding to practice the MAD tactics. Subsequent to this maddening occurrence, it has become a mandatory detachment procedure and checklist item to set the radar pointers at 200 feet prior to deploying the bird. I had planned to write our homebased squadron of this experience in order that it be written up as a recommended NATOPS change. However, a major exercise intervened and I forgot to follow through with the report.

Shortly thereafter, an incident report revealed that one of my squadron mates pulled the same trick but luck wasn't on his side. His copilot wasn't on the ball as was mine. Scratch one MAD bird! Now these MAD birds are scarce megabuck items, not to say anything about the embarrassed pilot's ego being somewhat deflated. Needless to say, I feel terrible about my incident and had I properly disseminated my experience in a more timely manner, his incident might never have happened. I finally forwarded my NATOPS change recommendation to the proper authority and the message rings out loud and clear. Don't keep a good idea to yourself for any reason. *Communications* is a major key to safe flying. ◄



Problems? Holler Mayday!

TWO minutes after takeoff in an AV-8A, the pilot, who was flying a local training flight, saw a large bird in his flightpath. He was in a climb and had no chance to maneuver to avoid it. The bird was ingested in the port intake.

The *Harrier* was just reaching 1000 feet at the time and was indicating 300 knots. The engine immediately surged, and the pilot retarded throttle to no avail. He knew he would have to shut down.

The pilot secured the engine. Moments later, after a relight, he broadcast his problem but didn't declare an emergency. He dumped fuel and started back to the field, avoiding populated areas. After the relight, he only could get an engine RPM of 60 percent – not enough to stay airborne. The pilot was able to coax a momentary power response of 70 percent, but then a flameout occurred.

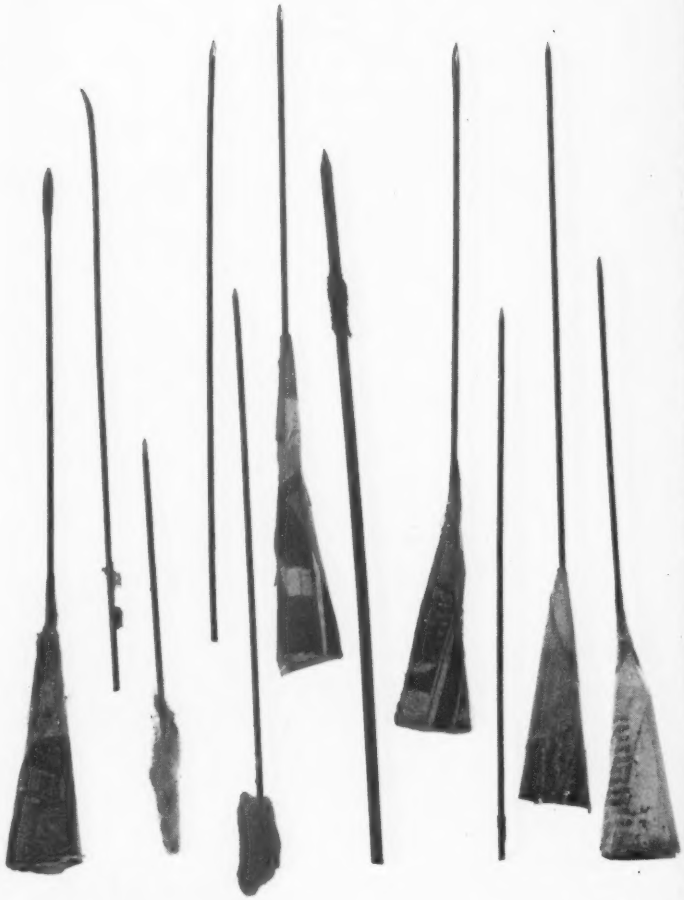
At 800 feet, 190 knots, he made a correction to point the aircraft away from the populated area and ejected at 500 feet. While descending, he saw the *Harrier* impact on an oyster bar and come to a stop in about 300 yards, after snapping off several telephone poles. The aircraft came to rest inverted, relatively intact, but it received strike damage.

The AV-8A ended up in an area where there was good tidal action, and was almost completely immersed twice before being salvaged by a CH-53 the next day. Investigation confirmed that a large bird had been ingested, and the engine was turning at a very low RPM at impact.

After ejection, the tower received an 18-second emergency transmission, but it went unrecognized as an emergency beeper. Confusion existed regarding the exact location of the pilot. The tower controller thought he had the disabled aircraft in sight, but he was looking at the wrong one. State police also had incorrect information and directed the SAR helo away from the impact area. However, eyewitnesses of the crash finally relayed the correct location to the SAR helicopter. The SAR helo pilot was aided in the pickup by sighting an orange parachute panel which the AV-8A pilot spread on the ground.

When you're in trouble, *declare an emergency.* There are lots of people who will help you, but you have to let them know you need help. ◄

MYSTERY

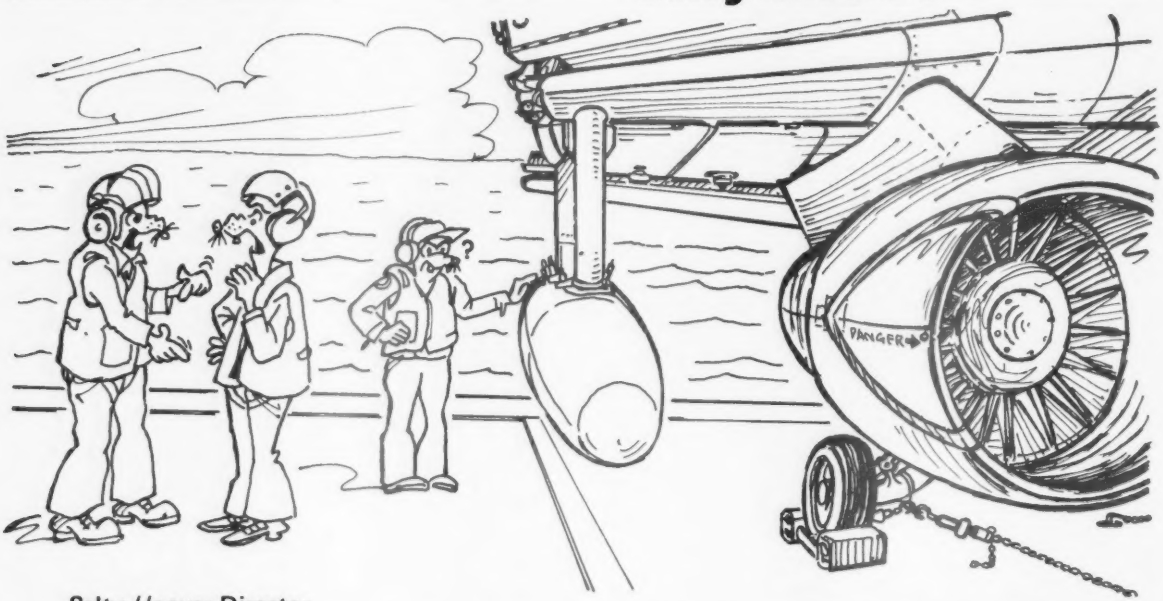


VERY few incidents take place today that haven't happened before. Discovering something that is one of a kind is rare, but this may fit that category.

LCDR Al Mears, HSL-34 Safety Officer, discovered the darts (shown in the photograph) embedded in the wood of the overhead, 40-45 feet above the deck, in hangar LP-13 at NAS Norfolk. A call to Public Works brought quick action to get them down.

Most were barely stuck in the wood. When dislodged, they would have turned over in the journey to the deck, pointy end down, and were sharp enough to have penetrated one's skull. No one knows how long they were up there, but one dart had a paper fin with the date 1974.

Anymouse



Salty *Hoover* Director

AN S-3 *Hoover* scheduled as down traffic on elevator one, was meticulously spotted by an experienced director and towtractor driver. On signal, the blue shirts quickly chocked and chained the S-3 while the director turned his attention to the respotting of a down traffic *Vigi* near the *Hoover*.

After both aircraft had been properly chocked and chained, a concerned plane captain directed the yellow shirt's attention to the apparent overlap of *Hoover* wing butt and CVN flight deck. The "salty director" inspected the clearances and acknowledged that "Yes, it would be close but not to worry, the *Hoover* would make it unscratched."

Still concerned, the plane captain hunted down the squadron maintenance chief and pointed out the problem to his supervisor. The chief agreed with the plane captain and called flight deck control to have the S-3 respotted prior to the lowering of "L" one. In response to the chief's request, the aircraft handler dispatched another yellow shirt to the scene to judge the questionable clearance.

A heated debate followed, with "salty director" staunchly defending both his pride and his spotting ability. He finally decided that the only way to conclusively prove his point was to slowly lower the elevator and give his critics a closer look. This was attempted, but instead of a gradual descent the elevator dropped suddenly, stopping after approximately 4 feet of travel. The director, undaunted, chastised the elevator operator and told him to lower it another foot and to do it slowly this time. You guessed it, the elevator dropped another 4 feet. The tiedown chains held as advertised, but the wing butt area on the *Hoover* didn't! The result was a needless flight deck crunch which cost the squadron 75 man-hours and $2300 to repair.

This evolution, unbelievable as it may seem, took just over 20 minutes. How prudent and economical it would have been if this 20 minutes of inconclusive debating had been 5 minutes of decisive respotting.

Crunchmouse

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

REPORT AN INCIDENT
PREVENT AN ACCIDENT

Do It Now

IT was a bright, clear, dry day at NAS. Morning flight operations were underway. As is usual on a busy ramp, pilots, plane captains, and operators of GSE were everywhere.

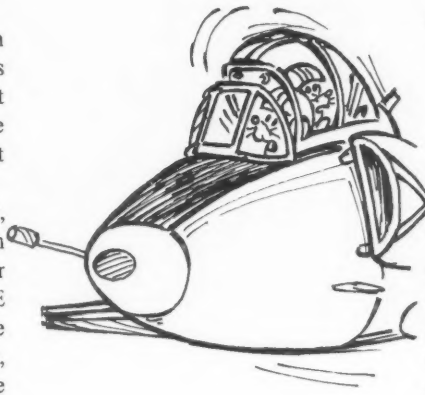
One plane captain was backing an NC-8A MEPP toward a fast mover. As he approached the aircraft, a bolt holding the brake pedal failed. The NC-8A struck and bent the aircraft boarding ladder.

Naturally, as one would suspect, the operator was approaching at an angle which allowed no room for error and thus was in violation of GSE operating procedures. GSE brake failures are legion in naval aviation, and this was another one. Had the driver approached the aircraft properly, the incident would never have occurred.

One important aspect during the day's operations was that the CO had observed the previous launch and

spotted incorrect procedures. He made a mental note to speak to the maintenance officer upon his return from flight. The maintenance officer who was flying saw similar violations and made a mental note to correct them later. Neither one corrected them *on the spot*, and an hour later the crunch occurred.

Sadsafetymouse



"Roger, Tower, Canopy Down and Locked

Flying my trusty TA-4 on a fam solo, I thought that it would be real "cool" to ask the tower for takeoff clearance while taxiing out. This *modus operandi* would hopefully get me airborne ahead of my fellow studs, patiently waiting. Sierra Hotel would be in order. Procedure was to acknowledge to the tower that the canopy was in fact – down and locked. (Of course, I always did that).

Once airborne, I proceeded to the aerobatic area and commenced the series of rolls outlined in the syllabus. After several aileron and rudder rolls I suddenly became aware that the canopy was moving in a most unusual manner. Stark terror-ridden eyeballs of this student focussed on the canopy locking handle! How could it be that it was in the "unlocked" position? Fortunately, I was able to lock it and proceeded with the rest of my "straight and level" hop.

Needless to say, I deserved the Delta Sierra Award of the day and consequently went back to the basics – checklists! Trying to be "cool" resulted in a "not-so-hot" pilot that day.

Canopymouse

It Only Happens to the Other Guy, Right? Wrong!

WHILE making a night GCA in VFR conditions in our trusty *Huey*, the controller vectored us to the final approach course when one of the engines' "OIL PRESS" caution lights illuminated. Although there were no secondary indications, we declared an emergency, terminated our GCA, and proceeded VFR to the airfield 12-14 miles ahead. After reviewing the UH-1N NATOPS Inflight Checklist and discussing the situation, we decided to roll back throttle No. 2 to flight idle and make a single-engine precautionary approach. We thank our lucky stars that we were flying a twin-engine helo; however, we had a "something's not right" feeling. Retracing our steps, we found out very quickly why we had butterflies! You guessed it – we had rolled back the *wrong* engine! Needless to say, we immediately remedied the situation and continued on to an uneventful landing. The problem, fortunately, turned out to be a faulty switch and not an actual oil pressure problem. Had we experienced an actual engine problem and in turn secured the wrong engine, over mountains, at night . . .

I have always been amazed at reading about two Fleet-experienced, highly trained aviators who pull the wrong handle, land gear-up, run out of fuel, etc., but now I know it *can* happen to anyone! Thanks to this inexpensive but sobering lesson, sign me . . .

Believermouse

Good, Bad, and Ugly

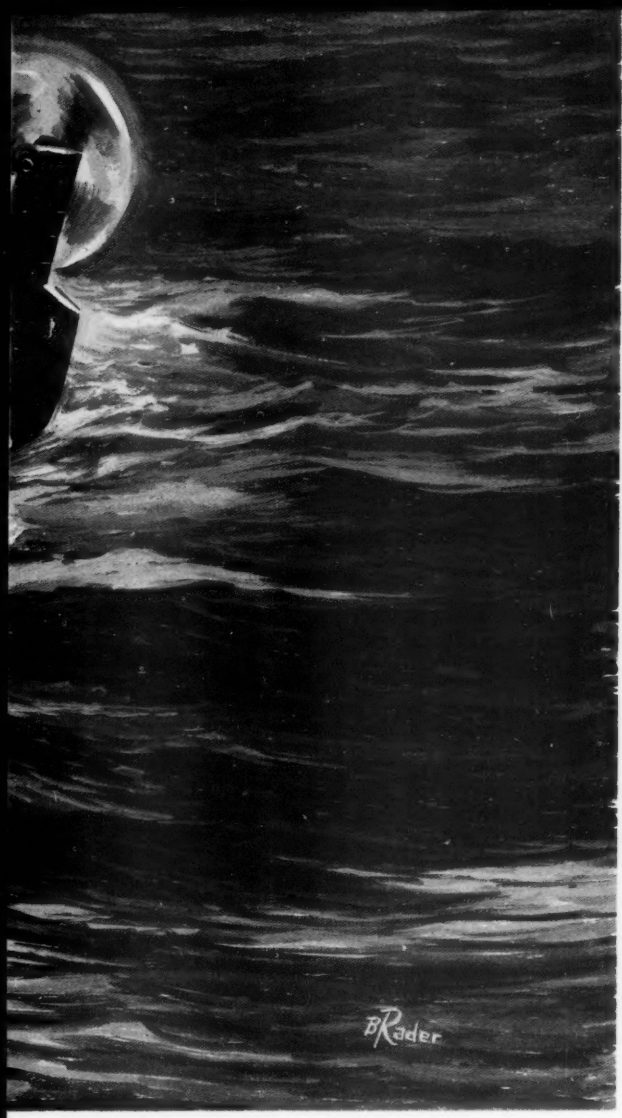
A LAMPS helicopter returned from a checkflight one afternoon and was downed during a postflight inspection because of a discrepancy with the No. 2 sprag clutch. Squadron QA honchos and a factory representative were consulted and it was determined that the clutch was not completely disengaging.

Two options were available: either perform a combining gearbox change, or replace the sprag clutch. Quality assurance and the tech rep concurred that both maintenance actions were within organizational capabilities. (The latter has been performed many times at the organizational level but it is not authorized below depot level.)

At this point a chain of events began that are especially familiar to all detachment personnel, as well as to most operators and maintainers of aircraft. The bird was down, it was Friday afternoon, the detachment was scheduled to deploy for a Fleet exercise Monday morning, and there was no other helicopter to replace the sick one.

What to do? The OinC decided to change the sprag clutch, since it was the least time consuming maintenance action. However, the necessary parts and tools were not available, so a combining gearbox was ordered. Now the frustrations began. Supply had five in stock but couldn't deliver one until Monday morning. The det OinC regrouped on hearing that news and decided to order a sprag clutch and parts too. They couldn't do anything else, so they secured for the weekend.

Monday morning a special tool for changing the clutch was obtained but all necessary parts were not available. Supply reported the gearbox was in a warehouse and would be delivered as soon as a truck was available. The det OinC anticipating the arrival of a gearbox ordered the removal of the old gearbox. It was out of the helicopter by noon.



About 1300 the clutch parts were located. The next few hours were wasted trying to find out where the gearbox was. Supply delayed until 1600 when the det was authorized to go direct to the warehouse to draw the gearbox.

On arrival at the warehouse another disappointment was incurred. There weren't any gearboxes! Everyone went back to square one. It was decided to change the sprag clutch and reinstall the combining gearbox. At that point Supply had caused the det to lose a full workday, perform unnecessary maintenance work by removing the gearbox, and forced the detachment personnel to build up needless frustrations.

Finally, the sprag clutch was installed without any difficulties. A QAR (Quality Assurance Representative) witnessed the proper torques. This completed the clutch work. The combining gearbox reinstallation was then tackled. A problem arose in aligning the gearbox so that the input shaft splines would mesh with those of the speed decreaser gearboxes. Assistance to get everything lined up was obtained and the crew quit for the night. It was 2230. (Readers are reminded that all of the work was being performed by the few assigned to the detachment.)

Tuesday morning everyone in the detachment proceeded to the ship except three who were necessary to button up the combining gearbox work. Some uncertainty exists whether the rated mech or his helper installed the sprag clutch housing covers. The senior did observe the striker installing the covers and the senior thought the clutch housing, cover clamps, and combining gearbox input shaft spiral lock rings were grouped together. He assumed the lock rings were installed at the same time as the housing covers. No one ran a CDI on the lock ring installation. The day passed.

A QAR inspected the work before the detachment pilots performed a 15-minute ground turn. The rotors were turned through by hand and an unusual sound was heard. The tech rep was called at home (2000) and asked for advice. He requested that the QAR check both sprag clutches. This was done and no problem was apparent. The helicopter was ground turned, but after 10 minutes the gearbox oil pressure started dropping and a gearbox chip light illuminated. An oil leak from two loose lines on the gearbox were found and corrected. A small sliver of metal was found and removed from the chip detector and the detector was put back.

The helicopter was again ground turned for 15 minutes and five freewheeling checks were conducted with no problems. A 20-minute hover check was then performed. Everything was normal. The OinC secured all hands and the time was 2230.

The pilots, crewmen, and the passengers mustered Wednesday morning at 0730. The HAC received the call signs, radio frequencies, weather briefing, and the ship's location from Operations. The helo was preflighted (no discrepancies) and a fuel truck arrived to top off the tanks. Toolboxes, bags, and baggage were loaded aboard, and they launched *at last* at 0920. The pilot took up a heading to close the ship which was bearing 270/120 miles.

The weather at takeoff was IFR but shortly after departing the coast VMC was encountered and the HAC canceled his local IFR clearance. A climb to cruise altitude was completed and radio communications were established with an intermediate ship, which was going to be a fuel stop, enroute to their home away from home.

At 1000 the crew noted a power loss on No. 2 engine, N_g dropped to 72 percent, T_5 dropped to 420°C, torque went to zero, N_f remained at 106 percent, the combining gearbox oil pressure caution light came on, oil pressure

went to zero, oil temperature rose to the peg, and the chip light illuminated. Problems. Almost simultaneously the HAC transmitted a Mayday on guard. The helicopter was still 25 miles east. The HAC reported their problems and requested the ship close ASAP.

The HAC took the controls and started down from 3000 feet. NATOPS procedures were covered. Number 2 engine was switched to emergency fuel. Nothing happened. Obviously No. 2 was not driving the combining gearbox. In less than 10 minutes the helicopter was flying at 60 feet above the ocean at 70 knots. Number 1 engine was at topping, and No. 2 engine hadn't changed a bit. Ditching procedures were briefed, and a discussion on whether to secure No. 2 engine ensued.

The HAC decided not to jettison fuel and decided to keep the drop tanks until just before landing. The copilot dropped some smokes to mark their flight track. Ten minutes into the emergency the helicopter and the ship were only 6 miles apart.

Suddenly the rotor speed began to decay. There was also a rumbling noise and airframe shudders. The airborne emergency was just about over and a survival situation was about to begin.

The HAC told the crew they were going to ditch. He broadcast his intentions to the ship and then just had time to flare the helo as they ditched with zero ground speed and N_r at 72 percent. Their attitude was slightly right wing down, slightly nose low, and with a slight right yaw. The helicopter rolled over on its right side and sank in 30 seconds. All occupants exited without problems. There were no injuries except one passenger who bruised his legs.

Survival equipment worked as advertised. One passenger had trouble inflating his LPP-1 but he had help. His vest was inflated with the oral tube. Dye markers were put out and radio contact with an S-3 was established using the copilot's PRC-90. The ship quickly closed the scene, launched a motor whaleboat, and a transient H-3 came in too. The H-3 backed away when the HAC erroneously reported that one survivor had a back problem and the motor whaleboat was ready to pick up the survivors.

The survivors were picked up by the motor whaleboat crew, taken to the ship, received a medical check, and were given dry clothes. A little later they were transferred to a carrier on its way to port and they arrived in time for supper.

Certain areas of the rescue sequence bear comment. Several survivors had difficulty getting out of the water into the motor whaleboat because of the bulkiness of their survival equipment, the height of the gunwales, and their weakened condition. Further, when they reached the ship they were told that only seven occupants could be lifted in the boat. So, two boarded the ship using a sea ladder rigged on the fantail, and a couple climbed up a cargo net. The cargo net climbers were pooped and had to stop and rest halfway up. One, who used the sea ladder, had to lie down when he reached the deck due to exhaustion. Any of the climbers could have lost their grip and fallen back into the water or even worse fallen into the motor whaleboat.

The mishap was caused by the omission of the spiral lock rings on the combining gearbox input shafts, and CDI of the lock ring installation. Troubleshooters felt that this omission allowed the following sequence of events:

- The No. 2 gearbox shaft moved aft and the hub nut contacted the sprag clutch housing cover.
- The hub nut ground a hole through the clutch housing cover which allowed the gearbox input shaft to move aft, far enough to disengage from the speed decreaser gearbox output shaft.
- The hole in the clutch housing cover permitted oil to leak from the gearbox and the pressure dropped.
- The combining gearbox chip light illuminated due to particles created by the housing cover grinding.
- No. 1 input shaft was still engaged then and carrying full power to the combining gearbox.
- No. 1 combining gearbox input shaft hub nut ground through the sprag clutch housing which allowed the input shaft to disengage from the No. 1 speed decreaser output shaft.
- All drive was removed from the rotor system allowing the rapid decay in the rotor RPM.

In summary, there were many factors good, bad, and ugly which entered into this mishap. Without a doubt the maintenance error was brought on by only a few hands, fatigue, frustrations with Supply, pressure, anxiety, and failure to follow NATOPS/MIM procedures. On the bright side, the handling of the emergency by the HAC was excellent, and the quick response of the ship to close the scene and rescue all survivors was exemplary. ◄

The trouble with getting something right the first time is that nobody appreciates how hard it was.

Ace L.

BRAVO ZULU

LIEUTENANT Fred Brooks and his crew, flying a VS-28 S-3A *Viking*, were engaged in a series of GCA and visual approaches in the touch-and-go pattern following a routine 3½-hour training flight off the north Florida coast. Following two normal touch-and go's, the flight was vectored toward a third approach and the crew acknowledged the controller's calls for turns and landing gear prior to the turn to final.

The subsequent approach and touchdown were quite normal and without incident. After touchdown, full power was added and the associated noseup attitude indicated the aircraft was airborne and flying.

Almost simultaneously, LTJG Ed Baumgartner, a NFO qualified COTAC, noted a master caution light, No. 1 FUEL PRESSURE, and a degenerating No. 1 Engine Power indication. As asymmetrical thrust and reduced power conditions imposed themselves on the aircraft, LT Brooks immediately corrected for the low port wing and nose attitude by applying full opposite rudder and aileron and instinctively reaching for and retracting the landing gear.

As the No. 1 engine experienced an almost instantaneous failure, additional caution advisory lights illuminated, indicating further degradation of the important engine-driven utility systems. The loss of the No. 1 generator, associated power loss and loss of the utility system indicated a complete engine failure, visually confirmed through cockpit instruments.

With the aircraft still in a precarious state of flight, LT Brooks directed the COTAC to retract the flaps to the TAKEOFF position using EMERGENCY FLAP CONTROL. Simultaneously LT Brooks reduced the power on the No. 2 engine to alleviate thrust effects from a single-engine configuration.

LTJG Baumgartner continued to keep the local tower informed of the already declared emergency and provided the pilot with emergency procedure backup from the NATOPS pocket checklist while LT Brooks maintained aircraft control and established a small, but positive, rate of climb to 800 feet. Passing 5 miles from the airfield in a straight and level attitude, LT Brooks turned the aircraft downwind to set up for an extended final while keeping the aircrew informed of the now stabilized situation and further briefing for the expected single-engine, arrested landing.

Upon completion of the landing checklist and emergency extension of the landing gear, the tower confirmed gear and hook down prior to commencement of the final approach. Prior to touchdown, a full 15 degrees of rudder trim was removed and a successful arrested landing was executed.

Throughout the evolution the remainder of the *Viking* crew, LT Dave Hillier and AW3 Robert Donaldson, provided invaluable emergency backup by monitoring the radio communication and checklist requirements.

Postflight troubleshooting revealed a separation of the main fuel line from the primary feed tank at the engine pylon disconnect, instantaneously starving the engine and giving rise to a near catastrophic situation.

LT Brooks displayed outstanding airmanship in recovering his S-3A *Viking* from a critical emergency condition. He was ably assisted by his COTAC, LTJG Baumgartner, who constantly advised the pilot of altitude and airspeed during the critical early moments of the emergency.

By his expeditious, professional handling of this potentially disastrous situation, LT Brooks and his crew's actions saved a valuable Naval aircraft and even more valuable lives. Well Done!

Left to right: LT Fred Brooks, LTJG Ed Baumgartner, LT Dave Hillier, and AW3 Robert Donaldson.

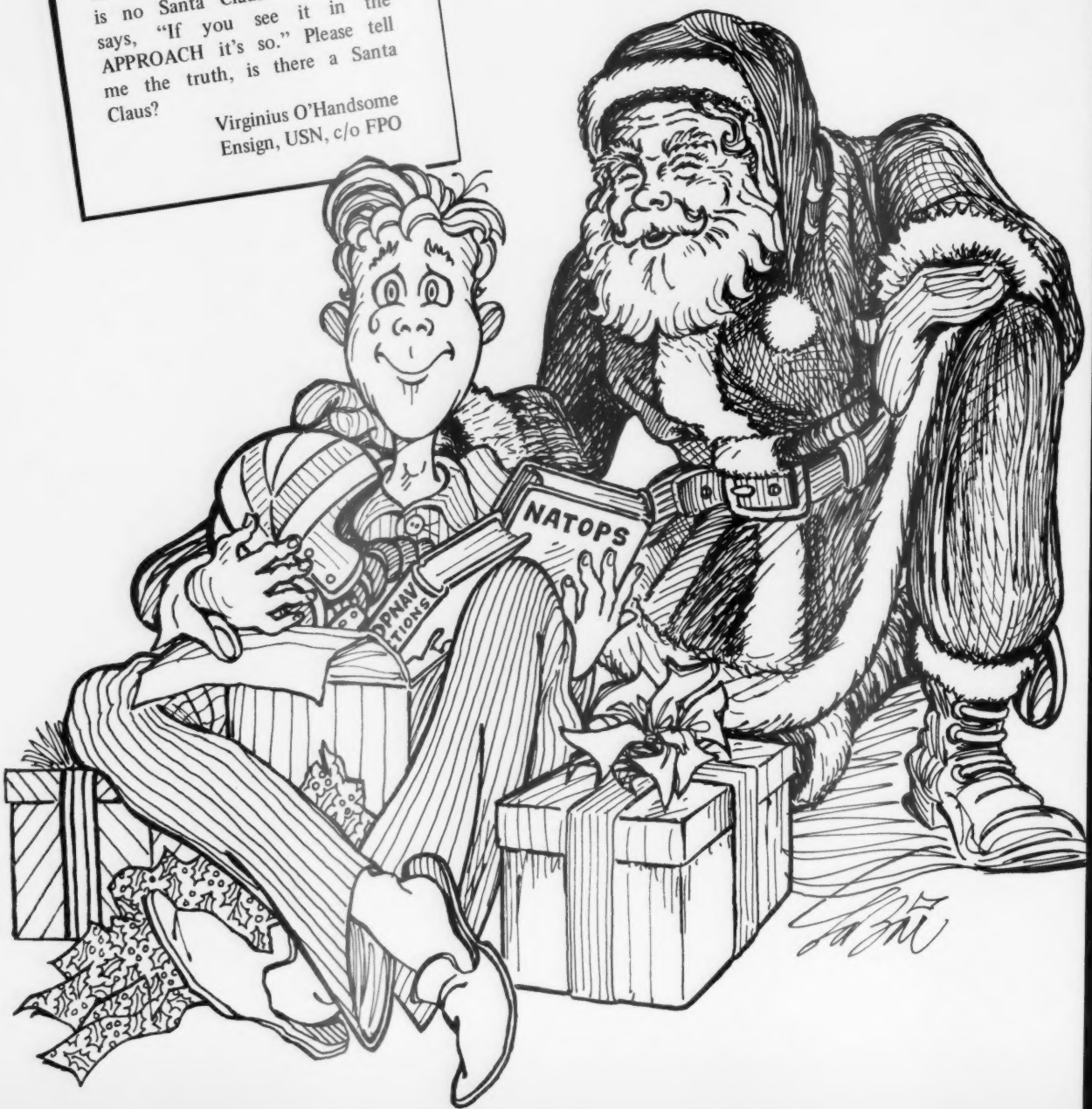
*We take pleasure in answering at once and thus prominently the communication below, expressing at the same time our great gratification that its faithful author is numbered among the friends of the APPROACH.**

Dear Editor:

I am 28 years old. Some of my naval aviator friends say there is no Santa Claus. The skipper says, "If you see it in the APPROACH it's so." Please tell me the truth, is there a Santa Claus?

Virginius O'Handsome
Ensign, USN, c/o FPO

There is a



Santa Claus

Virginius, your aviator friends are wrong. They have been affected by the skepticism of a skeptical post-war age. They do not believe except what they see. They think that nothing can be which is not comprehensible by their little minds. All minds, Virginius, whether they be men's or Nav-Cads, are little. In this great universe of ours an aviator is a mere insect, an ant, in his intellect, as compared with the boundless world about him, as measured by the intelligence capable of grasping the whole of truth and knowledge.

Yes, Virginius, there is a Santa Claus. He exists as certainly as Navy Regulations and operations orders and watch bills exist, and you know that they abound and give your life its highest beauty and joy. Yes he exists as certainly as Roger passes, perfect Charlie patterns, 92% gunnery scores, 4.0 check rides and undelayed recoveries. He is as real as your selection for promotion, as a service-wide pay raise or that bull's eye scored by skidding one into the target. He is as wonderfully real as that spin recovery beneath the overcast or that DR letdown that brought you out precisely over the field. He is as marvelously material as the hydraulic pressure that kept your wings spread when you forgot the pin.

Alas! Virginius, how dreary would be the world if there were no Santa Claus! It would be as dreary as if there were no gouges, or holes in the overcast or lost plane procedure, or no ensigns. There would be no child–like faith then, no leave, no cross-country RONs or accurate position reports to make tolerable this existence. We should have no enjoyment, except in sea duty and SDO. The eternal delight with which flying fills the world would be extinguished.

Not believe in Santa Claus! You might as well not believe in the flight schedule. You might get your skipper to assign men to watch all the uptakes around Fly One on Christmas Eve to catch Santa Claus, but even if they did not see Santa Claus coming down the stacks, what would that prove? Nobody, not even the Flag sees Santa Claus, but that is no sign there is no Santa Claus. The most real things in the world are those that neither ensigns nor men can see. Did you ever see the air officer in the air, or a landing signal officer make a carrier landing? Of course not, but that's no proof that they have not. Nobody can conceive or imagine all the wonders there are unseen and unseeable in the world.

You can probe a thunderstorm with radar to see what makes the turbulence inside, but there is a veil covering the unseen world which not the strongest search gear, nor even the united strength of all the preflight muscles in the program could tear apart. Only BUPERS orders, OPNAV Instructions, pilots handbooks, E6B computers and the VN diagram can push aside that curtain and view and picture the supernal beauty and glory beyond the overcast. Is it all real? Ah Virginius, in all this western world there is nothing else so real and abiding.

No Santa Claus! Thank God he lives, and he lives forever! A thousand years from now, Virginius, nay 10,000 years from now, he will still gladden the hearts of aviators who fly safely from Christmas to Christmas! ◄

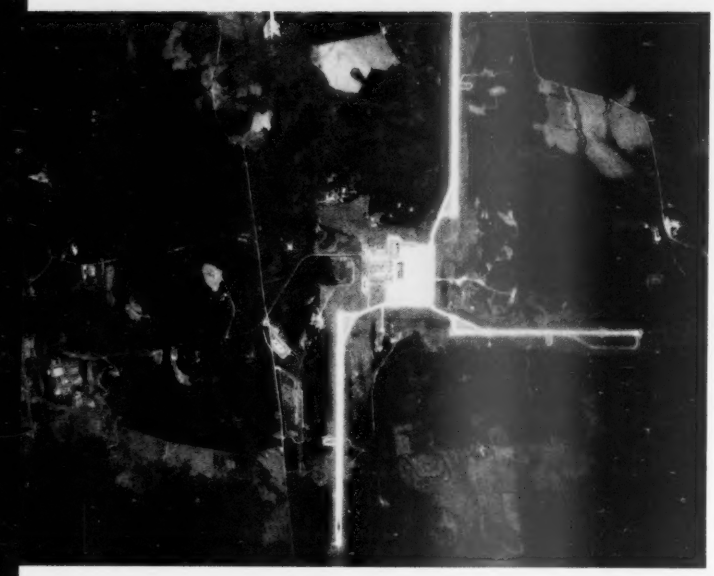
**Suggested by the famous "Yes Virginia" editorial.*

Airfield Profile: No. 7

NAS Meridian, Mississippi

McCain Field

By LT Wayne Minnick



NESTLED among the pines and rolling hills of East Central Mississippi is one of the Navy's most modern airfields – NAS Meridian. Located 14 miles north of the City of Meridian, the Naval Air Station covers more than 8000 acres. It provides airfield, administrative, family housing, and recreational facilities. The airfield has two offset, staggered, North-South parallel runways 8000 feet in length and one East-West runway 6400 feet in length which are capable of handling just about anything that flies. Likewise, the Air Traffic Control Facility and ATC procedures are designed to accommodate a huge volume of air traffic. This traffic ranged from a wartime high of over 250,000 landing and takeoffs to the current 170,000 landing and takeoffs per year, not counting the outlying fields.

Arrival procedures. Arriving at NAS Meridian (McCain Field) you will probably be vectored to Runway 18L (our primary instrument runway) for a PAR final approach. Due to the amount of local training aircraft, we recommend the PAR final over a radar vector to the pattern. Take your choice, but remember, we simultaneously use 18R for practice PARs. The same goes for landing on 36L, be alert, watch for traffic to the right side.

If you are flying northeast of McCain beyond 25 miles and below 2500 feet don't expect too much from our TACAN. Between the 030 radial and the 070 radial, it's unreliable at that altitude and distance.

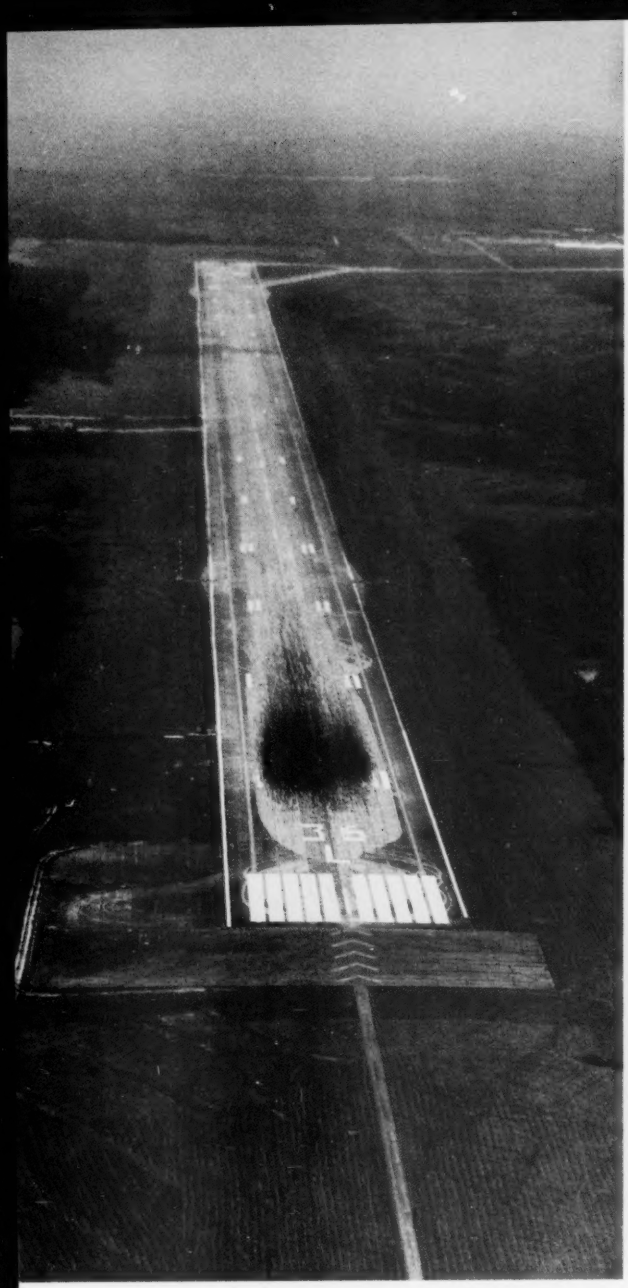
Departures. We do not have SIDs at NAS Meridian, so all instrument departures are handled via radar vectors.

Course rules. Just about everything is standard at McCain Field except arriving helos that plan to land on the ramp are requested to make a steep approach for FOD control.

Our taxiway is along the outside perimeter of the mat area. The Control Tower cannot see the southern portion of this taxiway so be on the alert for squadron aircraft taxiing in that area.

Noise abatement. Air Traffic patterns, procedures, airport operating hours, and runway utilization have been developed to minimize aircraft noise in the surrounding community. All pilots are requested to adhere to pattern altitudes and air traffic procedures. On climb-out, please utilize your NATOPS optimum climb angle and secure afterburner when no longer required.

Special problems. Our basic mission at Meridian is the support of training squadrons assigned to Commander Training Air Wing ONE. For you transient folks, two items should be of primary interest. First, we have three squadrons assigned that fill the air every working day so keep a sharp eye out for other aircraft. Second, because we are a training base, many factors are cranked into our hours of operation, e.g., student load, weather, etc., so make it a point to check and recheck our NOTAMS.



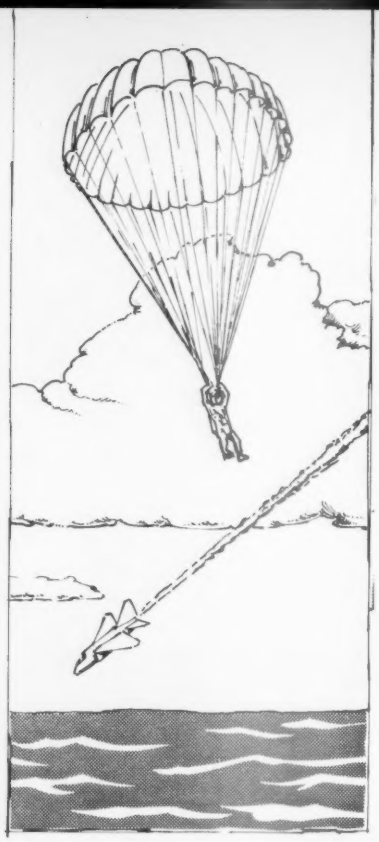
T-39D drivers must obtain a PPR so we may adjust the arresting cable on the duty runway prior to your landing.

Arresting gear. E-28 gear on all runways which can be re-rigged within 5 minutes.

Transient services. Transportation to and from Meridian is by scheduled bus or taxi unless you happen to have a friend stationed at NAS. Again check NOTAMS and hours of operation in your IFR supplement. Call us if you plan to arrive after 1600. This is particularly true for aircraft (helos) which are on a VFR flight plan. While you are waiting, we have a snack bar that operates MON – FRI, 0630 – 1900. Box lunches are available through the Operations Duty Officer. Please fill out the Transient Line Comment Sheet. This is a primary means of improving our transient service.

Messing/Berthing. The BOQ and BEQ are available for crews that plan to RON. Transportation to each will be provided. The Officers' Club is located across the street from the BOQ and the EM Club is about a city block from the transient barracks.

If you are out our way, stop by – if you are planning to and need further info, call us – Autovon 446-2505/ 2470.



1.

SEAPAC

Naval Safety Center statistics reveal that for the 7-year period from 1969 to 1976, there were 387 overwater aircraft ejections, with 59 of these resulting in drowning of the pilot or flight crew. Almost half of these deaths (26) were confirmed to have been caused by dragging due to high winds, entanglement in the shroud lines, failure to inflate the flotation garment or a combination of these conditions. In our opinion, all of these 26 lives could have been saved if proper safety equipment had been available to the aviators.

The SEAPAC (Sea-Activated Parachute Automatic Crew) release system has been developed to solve the problem of parachute release. It is a fully automatic system which will release the parachute upon entry into salt water, yet is totally inert during normal flight operations.

SEAPAC is a completely self-contained system that attaches to, and interfaces with, the two parachute release fittings. There is no physical interconnect of any kind to the aviator, crew seat or aircraft – no power, signal or mechanical cable to be hooked up or broken in handling. This approach allows SEAPAC to be installed in any ejection-seat-equipped aircraft. For other applications, SEAPAC II can be installed on the riser straps or parachute pack and the pyrotechnic actuator would operate a riser strap-cutting device. The importance of these features becomes more apparent when we look at the problem.

Drownings after successful overwater ejections have occurred since the ejection seat was first introduced to Naval aviation. While the parachute and restraint harness make escape possible upon ejection, they threaten the pilot's very survival once he is in the water. Rough seas may cause a drowning too after an otherwise successful overwater ejection, primarily because the pilot cannot manually divest himself of his parachute and inflate his flotation equipment. If he ejects into water with a high surface wind condition, he may be dragged rapidly through the water, and the parachute will not deflate.

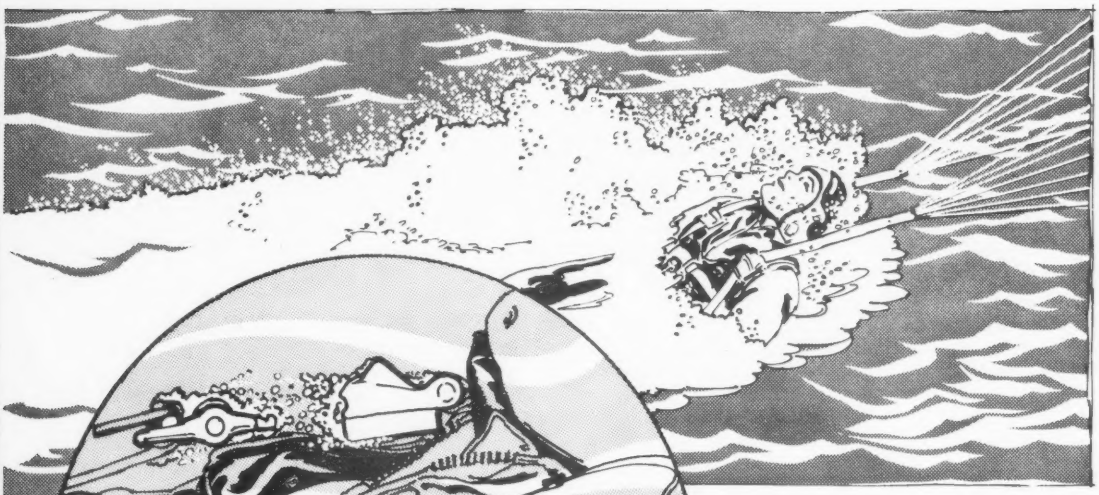
In low-wind conditions, entanglement in the parachute shroud lines becomes a lethal hazard, not only to the pilot, but to his potential rescuer as well. Even if the pilot retains his mental and physical capacities throughout the ejection ordeal, a cold and wet environment certainly adds to his problem of manually unlocking the two parachute release fittings in time to prevent entanglement or dragging.

Automatic release is the key. In the case of low-level ejection, only a few seconds are available between chute inflation and water entry.

The SEAPAC system will sense sea water within 2 seconds after immersion, charge a capacitor, and electrically fire a miniature pyrotechnic actuator which releases the parachute fitting. The total unit consists of an electronic actuator assembly and a modified parachute release fitting. The unit can be removed from the parachute for maintenance by removal of a single screw. However, it does not have to be removed for checkout. Configured for minimum size and weight so it will be compatible with the pilot and his cockpit operations, the SEAPAC unit is a completely unarmed device prior to salt water entry and is not affected by high humidity, heavy rainfall or salt spray. Only after immersion in salt water for between 1.5 and two seconds will the system be armed and operational.

Extensive testing has been done to prove the high reliability of the system. At the National Parachute Test Range, El Centro, CA, a Navy test jumper parachuted into the Salton Sea both with and without SEAPAC. The test was conducted with surface winds gusting 20 to 22 knots at the time he entered the water. Although the

Survival at sea. This illustration shows the critical sequence of events that take place when a U.S. Navy pilot or crew member who parachute harness is equipped with the SEAPAC safety device bails out over the ocean (Fig. 1).

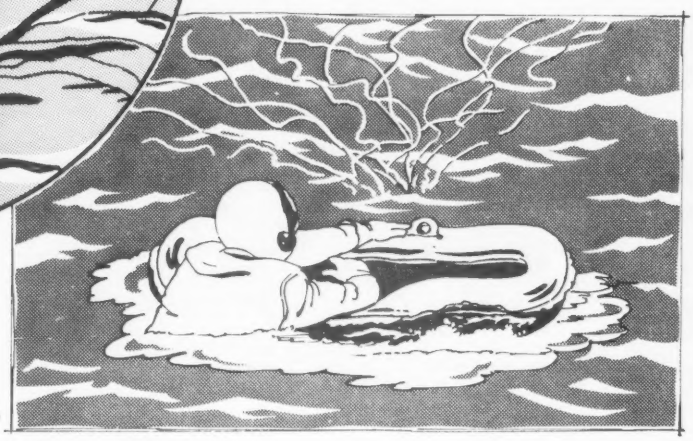


2.

Even if the aviator is not injured or stunned, he still can be helpless as his taut shroud lines pull him through the water (Fig. 2).

3.

In Fig. 3, SEAPAC's pyrotechnic actuator pops open the parachute fitting within two seconds of total immersion in salt water, which frees him to climb into his life raft and await rescue (Fig. 4).



4.

test was conducted with a highly experienced professional parachutist, he was in trouble the moment he entered the water without the device. During his wild ride, the test jumper was under the surface of the water at least 70 percent of the time, even though he had two life preservers and a liferaft. With SEAPAC, the parachute released when the jumper entered the water and literally flew downwind a safe distance from him and beyond the proximity of the rescue team. The jumper's flotation garment was inflated, and he was in an ideal condition to be rescued.

With the maximum reliability and low-cost maintenance of SEAPAC the Navy has undoubtedly found an answer to one of overwater ejection's biggest problems. The ease of installation, minimum size and fast, automatic operation are features that combine to make flying safer for Naval pilots. ◄

The Hurrieder You Go . . .

A PILOT noticed an unsafe uplock nose gear indication while in flight. Exercising the usual switches and recycling the gear did not solve the problem. However, by putting negative G on the aircraft a safe uplock indication did result.

The discrepancy was reported upon his return to base and maintenance troops went to work so that the aircraft could make a scheduled 2-week deployment. The aircraft was jacked up and troubleshooters found the uplock mechanism and switch needed adjustment. After the adjustment, the gear was cycled several times and worked satisfactorily. The aircraft was lowered and the final step, inserting a cotter pin in the switch actuator lever, is all that was needed to complete the job.

The gear handle was placed in the UP position and the hydraulic pump circuit breakers were pulled. So far so good. Now things get fuzzy. To expedite the job some members of the line arrived, hooked up a tractor, and a brake rider climbed into the cockpit to move the aircraft from the hangar to the line. This was done before the cotter pin was inserted.

The job was finished on the line, QA approved it, and the MAF was carried to maintenance control. At no time did QA, maintenance check personnel, or the brake rider check the gear handle. The aircraft was towed to the line – a mishap waiting to happen.

The plane captain conducted a preflight and signed off the aircraft without noting any discrepancies. The gear handle was still UP. Maintenance called Ops and advised the aircraft was ready for the scheduled launch – 10 minutes away.

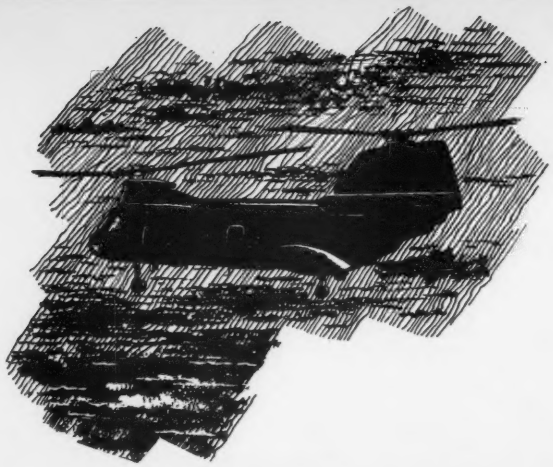
The pilot for the flight had arrived sometime before the aircraft was ready, but discovered his flight boots had been lifted from his locker. He shoved off for home where he had another pair stashed away. Even though he lived just a few minutes off base this caused a delay in the launch and maintenance wasn't happy that the flight was held up.

A half an hour after scheduled launch, the pilot arrived at the aircraft, conducted a routine preflight, and climbed into the cockpit. The pilot started No. 1 engine and he and the plane captain went through their control checks. The flaps, however, wouldn't cycle. A helper came up to lend assistance. He looked into the cockpit, saw that the hydraulic pump circuit breakers were out, reached across the pilot, and reset them. Bingo! The pumps operated, the nose gear smartly folded, and the only thing left for the pilot to do was secure the engine and exit the aircraft.

This debacle was a pure and simple case of haste. No one noticed the raised gear handle. The pilot didn't use any checklist, so there's no reason to believe he'd catch the gear handle either. He didn't.

. . . The Behinder You Get

FATIGUE



FATIGUE offers one of the greatest potentials for a pilot error mishap. The term "operational fatigue" has been coined to describe the combined detrimental effects of muscular exertion, anxiety, and boredom on pilot and aircrewman performance. While unscientific, this broad concept of fatigue is meaningful in the context of aviation.

Physiological and psychological effects of fatigue. Demonstrable physiological changes occur with fatigue. These include disruptions in timing, losses in fine motor control, increased variability in performance, and lowering of performance standards.

Acute fatigue effects are related fundamentally to momentary lapses described as "blocks." (Blocks appear to represent a complete cessation of psychologic function.) As fatigue accumulates, such lapses become more frequent. Overall efficiency is lowered. The performance of the fatigued flier seems to be largely characterized by normal levels of efficiency with blocks interspersed.

There are also different fatigue effects in different classes of tasks. Tasks based on gross, discrete cues are more resistant to fatigue than are tasks based on minute cues in which vigilance and alertness are important. Vigilance appears to be the function most affected by acute fatigue.

Cumulative fatigue is the result of inadequate recovery from several successive periods of acute fatigue or from several periods of inadequate sleep. Cumulative fatigue appears gradually over several days or weeks. Performance effects are like those seen in acute fatigue. Effects include poorer airmanship and degraded management and judgment during flight. Significant impairment in motivation, emotional control, and interpersonal relationships can develop. Among the more commonplace subjective effects are increases in bodily complaints. Tension symptoms increase, particularly, and there are frequent complaints of excessive fatigue.

As fatigue increases, performance standards deteriorate, yet pilots can show increased euphoria. Although pilots in one study accepted poor performance, they did not realize that their performance was suffering. At first, timing improved. Then it deteriorated. Gross errors appeared. Continuity of performance was lost. Peripheral information was ignored.

In addition, fatigue may result in general irritability, gastric disturbances, shortness of breath, and insomnia. Further, there can be deterioration in reasoning and judgment, sensory and motor hyperactivity, and lowered morale.

Factors which cause fatigue. Almost all stressors associated with aviation contribute to fatigue, either through muscular or mental activity or through the relevant psychological and physiological mechanisms. These stressors are well known. They include vibration, acceleration, heat, and oxygen shortage. One factor important in flying fatigue is the physical inactivity resulting from confinement to the cockpit.

Most significantly, performance becomes poorer during an extended period of work. As work increases, the body becomes more fatigued. Mental activity and emotions also increase fatigue.

Extracurricular factors causing fatigue include inadequate sleep (particularly during hot weather), financial or marital stress, excessive physical activity, and inadequate rest and relaxation.

Control of fatigue. Control of fatigue depends on a program considering diet, exercise, recreation, sleep, and operational scheduling. A balanced diet along with moderate exercise and adequate sleep is very important. So is taking time off during the week for recreation and relaxation. Ultimately, however, true relief from operational fatigue can come only in the form of sleep.

References

1. Aerospace Medicine, Hugh W. Randel, M.D., Editor, pp. 577-579.

2. *USN Flight Surgeon's Manual,* pp. 651-653.

KNOWLEDGE, SKILL, OR LUCK

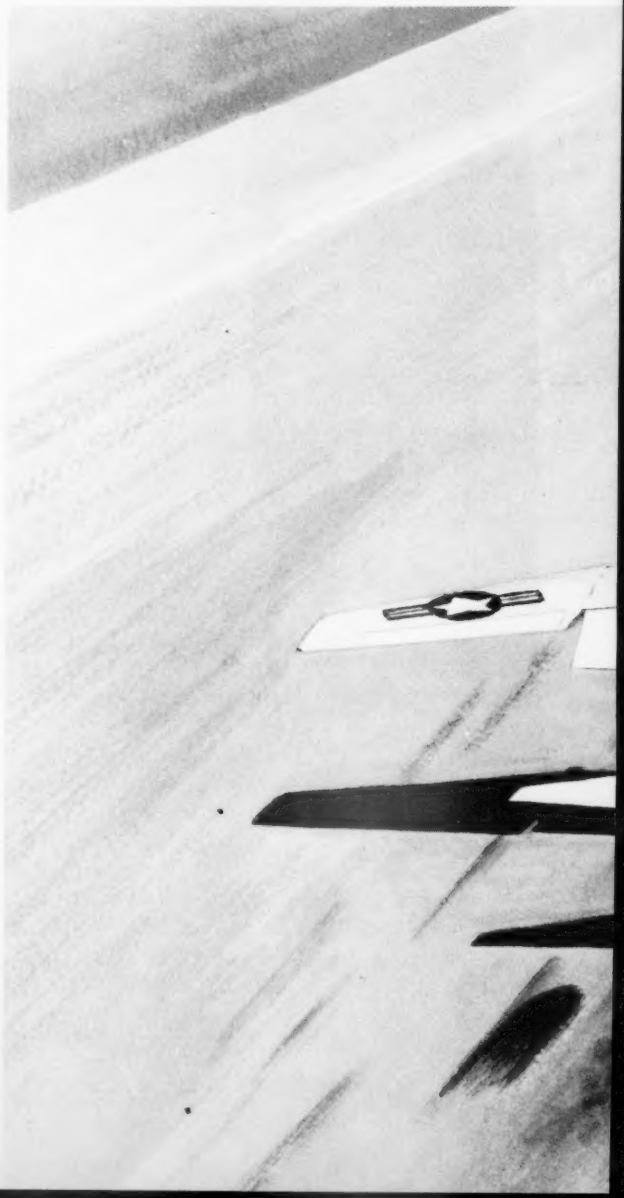
THE scenario is all too familiar to A-7E drivers. Compressor stall, TOT (turbine outlet temperature) rising above limits, emergency landing, ejection, and an unoccupied *Corsair* traversing open fields before coming to rest. Sound like a strike accident with major injury? Would you believe all that resulted was an aircraft incident (90 hours to repair the damage) and some minor bruises to the pilot. Here's how this potential Alfa damage mishap ended so fortunately.

A young fleet replacement pilot attached to a FRS was flying as No. 2 in a four-plane navigation training flight from Desert AFB to NAS Coastal. After about 45 minutes of flight, the pilot experienced engine compressor stalls as he descended from FL200 to 16,000 feet. He complied with NATOPS by reducing power to IDLE and lowering the nose to increase airspeed in an attempt to clear the stall. Simultaneously, he transmitted his problem to the flight leader, who immediately coordinated the emergency with Center. The flight diverted toward NALF Outlying, about 20 miles to the northwest.

When he realized the compressor stalls were not clearing, the pilot selected manual fuel control; however, this did not solve the problem. With the TOT rising out of limits, he secured the engine and initiated a relight soon thereafter. The engine compressor stalls continued when the throttle was moved above IDLE, necessitating a second shutdown. A second relight was attempted, but the same situation occurred.

While he was attempting stall clearing procedures, the A-7 pilot proceeded toward NALF Outlying, where he anticipated shooting a precautionary approach. The flight leader, knowing the field was closed, tried to raise the duty section on Guard frequency to alert them to the situation. Although this method failed, the duty section was contacted by Center through the local Flight Service Station. Unfortunately, they were alerted too late to man the tower and advise the flight of the available arresting gear locations.

As the *Corsair's* altitude decreased, it entered the standard Valley winter haze layer at about 3000 feet AGL. With the visibility decreasing to 1½ to 2 miles, he could not see the field. Circling the general location of the field in a port descending turn, the pilot finally saw Runway 12 pass his port side about 1¼ miles away. He tightened his turn to



stop the overshoot and lowered the gear and flaps to attempt an approach. Unable to set up properly for a circling approach due to lack of altitude and thrust available, the pilot corrected to centerline for a straight-in approach to Runway 12. He crossed the threshold high and fast, overflying the shortfield E-28 bidirectional arresting gear, touching down approximately 2000 feet down the 7000-foot runway. When it became apparent that his last hope, the longfield E-5 chain gear, was unavailable, the pilot broadcast his intentions, attempted to secure the engine, and ejected.

The crash crew, meanwhile, had manned their position on the field but were unaware that the ejection had already occurred. A crew from another facility at the NALF observed the mishap, picked up the pilot about 5 minutes after his parachute landing, and delivered him to the crash vehicle. The crash truck then proceeded to the aircraft, which had come to rest about 4000 feet past the runway in a plowed field. The engine was still running at IDLE, so the crash crew secured it.

The damage to the aircraft, miraculously, was limited to a broken canopy and several paint scorches from the ejection sequence. P&E estimated that 90 hours would be required for repair. The pilot sustained minor bruises from the ejection sequence and parachute landing. The compressor stalls were attributed to failure of the airflow control regulator which misscheduled the inlet guide vanes, causing stalls above idle RPM. ◄

Couldn't Hack It

TWO field grade pilots, with over 10,000 hours almost equally divided between them, were assigned to fly 19 passengers from Here to Yon. The TPC had 249 hours in the C-117D, and his copilot (designated T3P) had 31 hours in model.

The copilot was in the left seat and planned to make the takeoff. The tower controller gave clearance to taxi to Runway 1 and advised winds were 300 degrees at 10. While taxiing out, the pilots requested current winds and were told they were variable 210-300 at 6, with gusts to 16. They asked for Runway 19 and were cleared as requested. Just before takeoff, the wind was reported 270-300 at 6, and they were cleared for takeoff on Runway 19.

The TPC briefed the copilot on crosswind takeoffs and recommended a power differential of 10 inches MAP on the upwind engine. They taxied onto the runway, locked the tailwheel, and set the power at 30 inches.

Clearance to go was received, and the copilot increased the power on No. 2 engine, about 10 inches more than on No. 1, and then added additional power on both engines. The aircraft drifted left a little and then appeared to straighten out – momentarily.

The *Skytrain* then turned right, but no apparent correction was attempted. The aircraft departed the starboard side of the runway after 1500 feet of roll, and the copilot reduced power on both engines. The TPC didn't like the looks of the 6000-foot marker staring him in the face and grabbed the throttles – not the controls.

He two-blocked No. 2 throttle to miss the marker. The aircraft turned to port and returned to the runway at 2100 feet (of roll). The TPC then honked off No. 2 throttle and ran No. 1 to the firewall. The aircraft, however, refused to turn, departed the left side of the runway at 2400 feet, and rolled into a ditch. It pitched up on its nose and then returned to the three-point position in a free fall. (Guaranteed to test the quality of any filling in your teeth.) No one was injured.

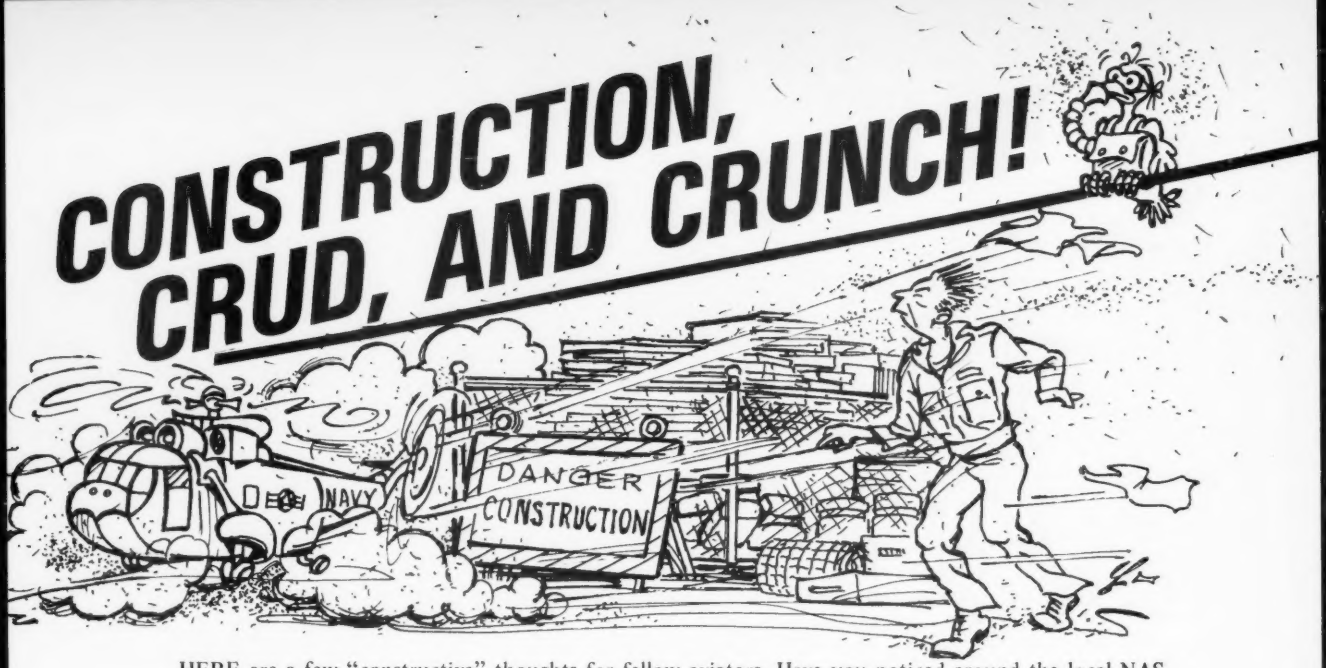
There is no doubt this was a pure case of pilot error. The TPC didn't take control of the C-117 when directional difficulties were encountered by the T3P. However, there were several mitigating factors that were determined to have a direct bearing on the final outcome of this mishap.

- The T3P had no prior crosswind takeoff practice but was allowed to attempt this one with passengers aboard. Poor judgment on the part of the TPC.
- The copilot was designated a T3P without completing the required training syllabus. Poor unit NATOPS enforcement.
- Failure to consider *all* personnel factors involved in this mishap. Poor supervisory judgment.

It is apparent that this activity's NATOPS program was not being administered in true faith and intent of the program. A lot of "after-the-fact" reasons uncovered many errors leading to this mishap. Prior-Proper-Planning could have Prevented it from happening in the first place.

A safety standdown and overall review of aircrew qualification, utilization and unit SOP was in order. Poor timing by all concerned. Now is the time to review your unit's NATOPS and other SOPs, not after you have had an accident.

CONSTRUCTION, CRUD, AND CRUNCH!



HERE are a few "constructive" thoughts for fellow aviators. Have you noticed around the local NAS, AFB, AAF, or civil airport, changes in the scenery such as construction projects finally doing away with those temporary World War II holdouts? How about the building of new facilities to modernize our aircraft maintenance facilities? Now is an appropriate time to review some of the hazards you may come across in conjunction with this construction.

The dangers of construction projects for aircraft and their crews fall into three basic areas: the physical change, the machinery involved, and personnel hazards. A quick look at each can give you a forethought of what to expect.

Remember where that familiar taxiway "used" to be? Well, now there may be a large crater. For pilots of large aircraft, are those dirt piles really that far away from your outboard engines, wingtips, or rotor blades? Even a minor construction job like replacing runway lights can make a hole just the right size to swallow a mainmount. And regardless of the size of the job, one of your larger challenges will be dodging all those pieces of equipment that construction crews drive and park in the most unusual places.

It doesn't require too much imagination to realize that wingtips, engines, or rotor blades can mutilate themselves on a porta-john, an idle bulldozer, or even so innocent an object as those construction markers with flashing lights. Also, a mobile 150-foot crane moving across the airport traffic area is a true threat.

We all know this situation exists, but how do you get safely out to the runway or back to the readyroom? Well, here's a hint or two for your consideration. First of all, where possible, personally take the time to look at the new lay of your land. It may mean having your aircraft towed out rather than taxiing. For a cross-country flight, be extra cautious when the IFR supplement or NOTAM mentions construction, since an obstruction on final may change the MDA/DH by a couple of hundred feet. If you're taxiing and are not *positive* of the situation, there's only one choice – STOP! Also, a full bag of wingwalkers is the only way to go in tight situations. If you think it's bad in daylight, wait until after sunset. Don't spare your taxi lights!

One element which crosses the line in increasing numbers during construction is that old troublemaker, FOD. Blowing dirt, dust, cement bags, and plastic cups (to mention only a few) can certainly ruin engines, pitot static tubes, and erode blades and props. It is here that line personnel suffer as well, with their eyes and noses serving as collectors for miscellaneous crud put into motion by nature or aircraft.

During postflight, remember to extra carefully inspect your aircraft and engines to counteract FOD and prevent later dangers. Always think of your men out on the line, because it may mean wearing those "ears" and goggles more of the time during the noise and air pollution of a construction project.

I know most of you can relate more sea stories, causes, and cures of handling yourself and your aircraft near construction, so talk it up and be prepared. Construction can be destruction. ◄

The pecking order for pilots to follow has always been: Aviate, Navigate, and . . .

COMMUNICATE

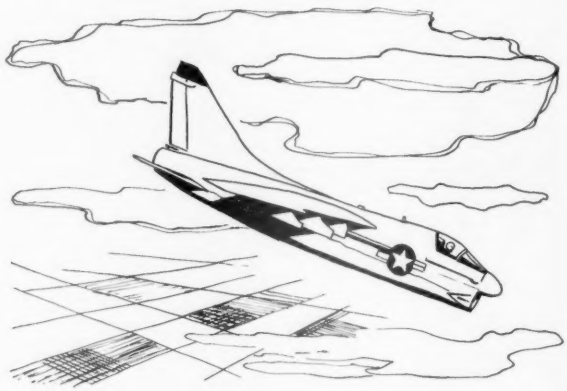
ANY pilot during the course of even the most basic flight will be communicating with several agencies between takeoff and landing. In this language we call English, there is so much room for misinterpretation it's a wonder that what you say is ever fully understood by anyone.

Now this is not critical when you're conducting business on the phone, or telling sea stories at happy hour, 'cause normally you'll be asked what you mean. Someone might even say "in other words" and all you have to do is shake or nod your head. However, it's another story if Center/Approach gives you a clearance and you foul it up!

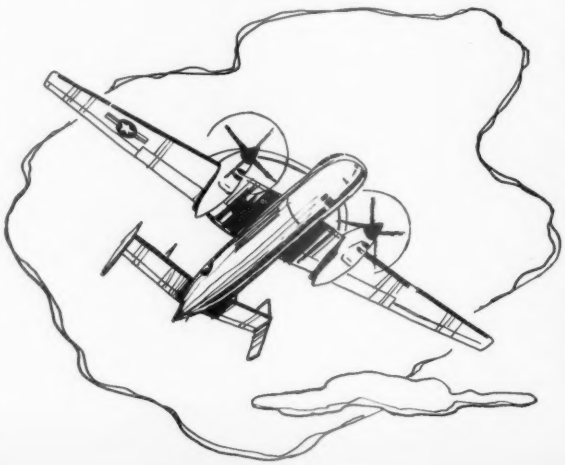
Unfortunately, the days are long gone when you can control your aircraft at the speed, altitude, and route you wish. Now there's a multitude of "big brothers" who are looking at you on a scope and they tell you do this, do that, do the other.

However, there is NO REASON to blindly follow what you're told. Remember any mistake could be at the expense of your life and others.

Let's consider a few examples to illustrate what we're talking about:



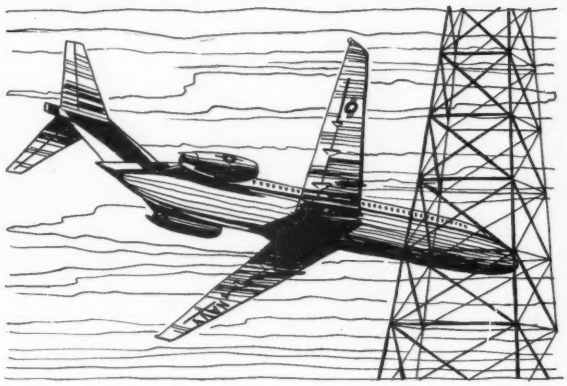
• An aircraft was at FL260 east of the airfield on a routine training flight. The pilot requested an en route descent and a precision approach. He was cleared to 8000 feet. During descent, control was passed to Approach. The pilot leveled off at 8000 feet and then was cleared to 3300 feet. Now this guy was S-M-A-R-T. He cross-checked his position on the TACAN approach plate which showed a minimum altitude of 6100 feet at 20 DME. He stopped his descent at 6100 feet. You know what had happened? He had been confused by the controller with another aircraft with a similar call sign. He missed becoming a statistic by not blindly following his clearance and knowing where he was.



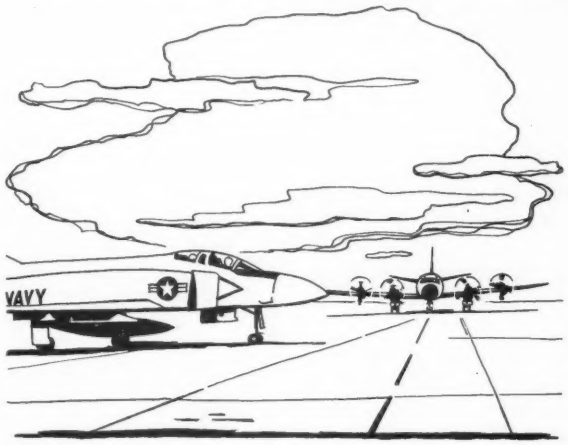
• A plane commander was sitting in the right seat and his copilot was flying the aircraft. After takeoff, Departure called and said, "Climb to one six thousand." The plane commander acknowledged. He next received a call and Departure wanted to know his altitude. He dutifully reported, "out of 8 thou for one six thou". Departure said, "I gave you six thousand." The plane commander said, "We'll descend to 6000", but Departure replied, "Negative, there's traffic below you. Climb, now, to one seven thousand." *We'll never know whether Departure originally said six thousand and the plane commander thought he said one six thousand or vice versa; but there was clearly a mixup and there could have been a midair.*

• An aircraft was placed in an untenable position because a controller failed to communicate his desire specifically. Upon arrival in the terminal area, ATIS

information informed the pilot he would be vectored for an ILS approach to Runway 10. The ILS was tuned and identified. After receiving a multitude of heading and altitude changes, the pilot was cleared for an ILS approach. (No runway number was given.) It became obvious that on this heading he wouldn't intercept the glideslope. And to make matters worse, upon reaching circling minimums there wasn't any airport in sight – just a great big TV tower which he had boresighted. He discovered that the controller had been vectoring him for an approach to Runway 15! The weather was thin obscured, 1½ miles in fog. Fortunately for the pilot, there wasn't any high terrain anywhere around the airport and he did see and avoid the TV tower.



• Another Tenerife? Could be. An aircraft taxied out at an airport with parallel runways and was cleared to taxi to Runway 28L. On the way, the pilot asked and was cleared to cross an intersecting runway, but then Ground told him to hold short. Short of what? The pilot was told to hold short of 28R, which he did. After many opportunities to cross had come and gone, the pilot wanted to know if he was cleared to cross 28R. He was asked if he was requesting 28L. Then he was advised it would be quicker to get out on 28R. The pilot replied, "Fine." It was impossible to taxi to the approach end of 28R from his hold-short position without taxiing onto 28R, and after another transmission the pilot thought the tower said, "Continue onto 28R for that turn." The pilot eased out onto the duty *and an aircraft in the takeoff position was delayed.*



• Near midair. A four-engine turboprop was on an IFR flight plan and was inbound to his destination at 11,000 feet. The pilot received a clearance to descend to 7000 feet. At his altitude, visibility was a mile in haze. He reported out of 8000 and was told to continue his descent to 7000. Upon reaching 7000 and entering the holding pattern he tried unsuccessfully several times to contact Center. The pilot continued twice around the holding pattern and then spotted an attack aircraft in the same pattern, same altitude, at his 1 o'clock position. The turboprop pilot hollered but quick! Imagine his surprise when Center said, "You're supposed to be at 6000." Center then handed both aircraft off to Approach. The attack pilot was told to climb to 8000, the turboprop pilot was descended, and each one was cleared for a sequential approach.

In the examples given, it's easy to see that the communication breakdowns could have caused disaster. If there's any doubt about anything a controller says, then ask for a repeat. The pilot shooting the ILS approach (who realized his vector wouldn't permit him to intercept the glideslope for Runway 10) could have questioned the controller about what he had in mind. *Pilots must remember that a healthy dose of skepticism is the key to longevity,* and there's nothing better than knowing where you are and where you're going during all those "turn left, turn right" instructions. ◄

Letters

Water Survival

NATC Pax River – I recently had an opportunity to participate in a water safety program at the Armament Development and Test Center (ADTC), Eglin Air Force Base, Florida. The training included a 5-minute parasail ride (a parachute pulled behind a speed boat). The end of the ride culminated a free fall from approximately 200 feet and a water entry. I learned more survival techniques in that 5-minute parasail ride than I have in 9 years of Navy water survival training. The ADTC Wing Commander, who was also participating in the training, commented, "We have all our pilots do this once a year because at Eglin most of our flying is over water." My Navy, are you listening?

LT Joseph Dyer, USN

Re: Clue

Chesapeake, VA – In reply to the article in the October issue, "Anyone Have a Clue? Anyone Want to Comment?", my fleeting memory (I retired from the Navy 20 years ago) recalls a similar accident when I was flying the R6D, now you call it the C-118.

The picture of the R6D on its nose looks a lot like one I recall seeing in an APPROACH issue back in the middle '50s. You used to have sections labeled VF, VA, VR, VP, etc. back then. I haven't seen an issue since then until this one, which I found at the local airport. I see the format has changed. Although somewhat reluctant to change, I like the new APPROACH (no pun intended).

Anyway, if my memory is correct, I recall that your accident was caused by the landing gear lever being in the neutral position or not exactly in that position. Not having flown the R6 in more than 20 years, I don't recall which caused the nose gear to collapse. I think if you look back in the archives, circa '56-'57, you'll find the article in the VR section.

Keep up the good work!

Fly Safe!
LCDR, USN (Ret.)

• The photo and writeup you refer to is shown below:

Checker's Woe – While checking a prospective R6D first pilot, the checkpilot set up a simulated engine-out and a hydraulic failure for the final landing.

The descent and approach checklists were completed before turning base, and the hydraulic system pressure was bled off by the checkpilot. Downwind, flaps were lowered 20 degrees by the emergency pump. After turning base, the gear was dropped by free-falling and a safe indication was obtained.

As additional flaps were requested after turning base it was necessary to return the gear to NEUTRAL so as to allow the pressure from the emergency pump to actuate the flaps without delay. However, the gear handle was left in NEUTRAL for the remainder of the landing.

After touchdown, reverse pitch was used and after the throttles were returned to normal the pilot reported a loss of nosewheel steering and only weak braking action. The checkpilot then took over and turned off the runway by using the throttles.

When the aircraft had slowed to about 5 knots, both the jumpseat pilot and the pilot observed the gear handle in the neutral position with the unsafe light on. The pilot put the gear handle DOWN, and with that action the nose gear collapsed.

The crew involved agreed that the accident could have been prevented by checking the gear selector handle and returning it to the DOWN position before touchdown. In putting the handle down the accident board felt that the pilot momentarily raised the handle, allowing pressure into the up lines and collapsing the nose gear. It was found after the accident that a movement of only ½ inch out of NEUTRAL position is all that is necessary to allow sufficient pressure to enter the up lines and actuate the gear.

F/E Duties

NAS Willow Grove – After reading LCDR Rakowski's letter in the SEP '78 issue of APPROACH concerning flight engineers reading the checklists on P-3 aircraft, I also would like to make a few comments.

Many squadron SOPs require the F/E to wear a headset during engine starts, taxi, takeoff, climb, approaches and landings. The purpose behind this being to back up

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the pilots and be aware of any pertinent info coming in on the ICS. Although it would not be his duty, he would have a difficult time ignoring incoming calls concerning "Traffic at 12 o'clock, One Mile". Therefore his habit patterns could also be broken.

His attention to engine instruments during the approach and landing are of a highly critical nature and any malfunction during this period could be cause for a break in normal habit patterns.

The F/E's responsibilities on this aircraft are extensive and varied, especially during the critical phases of flight.

I agree in adding an F/E response to "GEAR DOWN" on the checklist as an extra line of defense, but to make the majority of the responsibility his, never!

AMHC John Krainiak
RESASWTAC School

Add Another Category

FPO, San Francisco – We departed Islandhome one afternoon on a cross-country for another base several hours away. After takeoff and climb to assigned altitude we had a utility hydraulic failure about 150 miles out. Center was informed of our problem and our desire to RTB. In short order we reversed course, picked up a clearance, and headed back.

We were way overweight for landing and unlike some of our more fortunate brothers we had no dump system. So we had to burn down. When we told Center, they couldn't have been more cooperative. They let us pick an area in the clear at 50 miles and we began a series of roundy-go-roundy for an hour.

When we burned down to reasonable weight we were cleared to dirty up and start our approach. We dropped everything and began a straight-in approach for an arrested landing. Islandhome had been advised we were returning and made preparations to recover us. There wasn't any LSO to help us, but everything else was ready.

We touched down on centerline, on speed, 500 feet prior to the arresting gear. We engaged at 110 knots. It felt normal until the last 10-15 percent of the rollout. Then we decelerated rapidly. After we stopped, the tension began to pull us backward rather quickly. Despite our attempts in the cockpit to keep it straight, the nosewheel turned, causing the aircraft to swerve and pivot around the starboard mainmount.

We held our breath since we couldn't stop the rearward movement of the aircraft, because of the absence of normal braking and nosewheel steering. We couldn't get on the emergency pneumatic braking system in time.

The tower told us the crash crew reported we had a fire in the port engine. We secured the engines and the fire went out. During the roll back the tailhook broke off and the arresting cable damaged the port engine and tailpipe cowling.

Now you have the details. What are the chances of adding a category other than the operating squadron, to take the rap for mishaps not pilot or maintenance caused? Suppose our bird had burned up. Wouldn't it be logical to absolve the squadron and show Islandhome as the culprit? Over.

Ferry Pilot

See next letter.

FPO, San Francisco – I was involved in an incident in my helicopter which could have ended in disaster but didn't.

Let me set the stage. My copilot and I were flying a cross-country late one afternoon to a civilian airport. It was the last leg of three, and we were to RON before continuing to our destination the next day. We lost our TACAN about halfway along the route over mountains and advised ATC of our problem. They assured us they'd give us vectors.

In our weakened condition we were utterly dependent on Center because at altitude, DR wasn't possible with any accuracy. To add to our problem there was heavy traffic. This, mind you, wasn't in any metropolitan area, but out in the boondocks where 20 operations a day meant a busy day.

Anyway, when we filed we had enough petrol to go where we wanted, plus an extra 30 minutes. Plenty of reserve fuel. However, with all the vectoring which ensued (90 degrees off course for 25 minutes), the pucker factor rose. We did not like the personal attention we were getting. We also were lost. When we asked Center for our position and distance to our destination there was no way we could make it.

We were one mike click from declaring an emergency when Center offered us a closer airport. We accepted with alacrity. However, it was too late for even the alternate, it was getting dark, and when the low level light came on we did declare an emergency, spotted a nice open area, and landed in a farmer's field.

I know there will be a lot of guys second-guessing us, but that won't bother me. I was there, they weren't. Who would have been whiplashed if the bird had been dinged? Your obedient servant.

Name Withheld

See next letter.

FPO, San Francisco – I've wanted to write you safety people for a long time. Now's my chance. I was almost the victim of a ground accident through no fault of my own.

I approached my aircraft for a night tanker flight. The aircraft was parked in a no-fly spot. I had plenty of time, so I asked the director for a respot. While he mulled it over I went about my business of conducting a preflight inspection. The director reported back in a few minutes that he had been told I could be started where the aircraft was.

I didn't like the idea because there was less than normal clearance between my UHT and a downed F-4, next to me. The director compromised. He pushed my bird back a little way and tied it down. My plane captain also voiced concern that we weren't in the best position to turn up.

I climbed in and after start all checks were OK up to the ARI check. When signaled I wiped out the cockpit. As I pulled aft and left I felt a reaction that meant trouble. Sure enough the tip of my UHT zapped the F-4. My aircraft was secured and nosey noses swarmed around to see what damage had been done. It wasn't real bad, but my UHT had to be replaced.

OK, OK, I shouldn't have wiped out the cockpit. I guess I did it out of habit. However, I was plenty mad at the director's ripoff. Why that yo-yo didn't give me more room when I requested it I don't know. I wasn't pleased with myself for not being more insistent. Then when I thought about my bird (the duty tanker) being in a no-go spot I became highly irate. Why is life so complicated for defenders of liberty?

No Name Please

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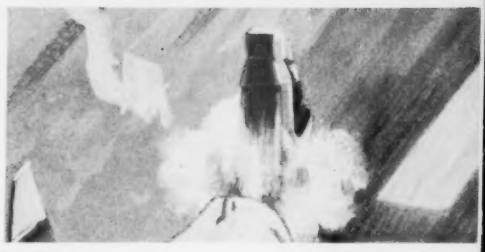

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CREDITS/Our cover painting this month by R. G. Smith, courtesy McDonnell-Douglas Aircraft Corp., depicts the F-18 *Hornet*. The *Hornet* is presently scheduled to begin test flights in the Spring of 1979.

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FLIGHT GEAR
IN THE DARK?
KNOW YOUR
EQUIPMENT
BY THE
'TOUCH SYSTEM'
AND SURVIVE!

Slay Ignorance.

Read your NATOPS manual as if your life depended on it.

Idea contributed by 1st LT Cris Erdos, VMAT-102